

ELECTRIC REFRIGERATION NEWS

The business newspaper of the electric refrigeration industry

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REVIEW ELECTRIC REFRIGERATION'S GROWTH AND NEEDS

Woman's Point of View and Industry Problems Discussed at Engineering Society Meeting

Two hundred men and women interested in electric refrigeration for the home, attended a dinner and meeting of the New York Section of The American Society of Refrigerating Engineers held at the Machinery Club in New York City on the evening of March 31. The program included addresses by Dr. Louise Stanley, Chief of the Bureau of Home Economics, Department of Agriculture, Washington, D. C.; F. M. Cockrell, editor of *ELECTRIC REFRIGERATION NEWS*, Detroit, Mich.; and Dr. Mary E. Pennington, of the American Association of Ice Industries. Stephen Bennis, of the United Electric Light & Power Co., New York, and president of the New York Section of the Society, was chairman. The attendance was the largest of any meeting in the history of the Section.

The woman's viewpoint on electric refrigeration was expounded by Dr. Stanley, who has made an extensive study of the practical problems of food protection in the home. She enumerated the appealing features of the electric refrigerator and also the objections and limitations which have come to her attention. She suggested a number of possible improvements in design which, she believes, will increase the enthusiasm of women for this modern household equipment.

Suggests Improvements in Design of Ice Trays

Among the suggestions made by Dr. Stanley were the following: That a tray for salads be provided immediately beneath the chilling unit. That trays for ice cubes be made in smaller sizes so that it will be unnecessary to extract a large quantity of ice in order to obtain a few cubes. That ice cube trays be made sufficiently shallow so that they will not stick if the housewife inadvertently fills them too full of water. She suggested that more complete and adequate directions for the use of the electric refrigerator be provided in the form of a card which may be hung on the wall for ready reference.

Dr. Stanley made a plea for more disinterested studies of refrigeration and food protection. Comparatively few scientific facts have been determined, she said, and much of the data which has been developed up to the present time is not available to the public. The average housewife is becoming increasingly interested in electrical devices, she said, and there is a real opportunity to capitalize upon this interest by providing more and fuller information.

One of the great dangers at the present time, according to Dr. Stanley, is the marked tendency of manufacturers and dealers to "talk down" their competitors' products. This only creates a distrust of all makes and is always harmful to the industry. In some quarters the idea is getting abroad that all electric refrigeration is experimental as yet and that it will be better to await further development. Men in particular, she said, are inclined to believe that the cost of equipment is coming down, all of which tends to defer the adoption and purchase of electric refrigeration.

Effect Upon Other Industries

Mr. Cockrell reviewed the effect of electric refrigeration development upon other industries and allied trades, particularly the ice industry, the manufacturers of refrigerator cabinets, the electric light and power companies, and the manufacturers of other electrical appliances for the home. He also touched on the effect of the activities of competitors in the electric refrigeration field.

The importance of good refrigeration has been so much stressed through the advertising and sales work of the electric refrigerator manufacturers, Mr. Cockrell declared, that the ice industry has been favorably affected. Earnings of ice companies have shown no losses that may be attributed to electric refrigeration, and there is substantial evidence that large numbers of families have been led to the regular use of ice where no form of refrigeration was used before. The efforts devoted to educating the public to the advantages of electric refrigeration in winter has also caused many families to continue the use of ice during these months, whereas they previously considered ice necessary only during the hot months. City dwellers in good circumstances seldom appreciate the fact, he said, that a large proportion of the public is not using ice or any other type of refrigeration either summer or winter.

Advancement in Cabinet Construction

The manufacturers of refrigerator boxes and cabinets have been greatly benefited by

Ice Bill Was \$40, Electric Refrigeration Costs Only \$15 Per Month in this Meat Market



The Noack Market, Boulder, Colorado, is using electric refrigeration with excellent results, having 26 feet of refrigerated display case in addition to the large cabinet shown in the rear.

A Servel commercial unit installed by the Public Service Company of Colorado, was connected up with the icebox already in the market. The compressor is set up in plain view in the rear of the store, where it may be seen by customers. According to Mr. Noack, his ice bill used to run \$40 per month, whereas the cost of the Servel is only \$15.

SUPERIOR MOVES TO NEW FACTORY SITE

The Superior Iceless Refrigerator Co., Inc., are moving their manufacturing plant from Wapakoneta, Ohio, to Canton, Ohio, where they have purchased a large building from the Timken Roller Bearing Company. This building, which provides 110,000 feet of floor space, was, prior to a year ago, occupied by the Gilliam Manufacturing Co. At that time it was purchased by the Timken firm.

J. F. Massey, production manager of the Superior Company, is superintending the work of moving and installing machinery in the new Canton plant. The new factory building is of modern construction and is well lighted.

The Superior Company was established by Senator James Couzens of Detroit several years ago, and was bought out by the present organization November, 1926. The company is composed of Canton, Akron and Cleveland business men. The sales and executive offices of the company are located in the Hanna Building, Cleveland.

FRIGIDAIRE, LTD. ORGANIZED TO HANDLE OVERSEAS BUSINESS

Frigidaire, Ltd., a Canadian corporation, has been organized to handle overseas operations of Frigidaire Corporation. The new organization will function as a division of Frigidaire Corporation, of Dayton, Ohio, a General Motors subsidiary.

Primary operations of Frigidaire, Ltd., for the present will be in England, France and Italy, where a number of sales branches are already established. A separate overseas organization has been formed for Germany, where General Motors electric refrigerator business is handled by Frigidaire G. m. b. H., the initials signifying limited liability. Frigidaire has overseas a hundred branches and distributors and more than a thousand dealers.

Magazine Section of Detroit Free Press Devoted to Electric Refrigerators and Oil Burners

A sixteen-page section, tabloid magazine size, was issued by the Detroit Free Press, April 5, in which "Ice from Electricity and Heat from Oil" were featured as the "2 outstanding 20th century modern household conveniences." The editorial columns are composed of interviews with

manufacturing and distributing executives, with facts and figures quoted from *ELECTRIC REFRIGERATION NEWS* and other publications. The advertisements in the section are exclusively presentations of electric refrigerators and oil heating equipment for home and commercial use.

NIZER APPOINTS WESTERN MANAGERS

Announcement is made by Harry A. Sieck, general sales manager, Nizer Division, Electric Refrigeration Corporation, and vice-president, Kelvinator, Inc., of appointment of Ray Legg to management of Los Angeles branch, with offices at 910 Pacific National Building. Mr. Legg, who resigned as vice-president and sales manager of Bierley & Elson Printing Co. to assume his new responsibilities, is well and favorably known throughout the Pacific Coast.

Mr. Sieck also announces that Harold G. Stern has been appointed to fill the position of manager of Seattle, Washington, branch, with offices at 208 Third Ave.

Mr. Stern graduated from Cornell in 1906 and spent the next 15 years with Niles Bement Pond Co., Philadelphia; Caldwell Bros. Machinery Co., Seattle, Washington; and the Air Reduction Co., Syracuse, N. Y. In 1921 he joined F. V. Fisher to take charge of the mechanical end of the Seattle Ice Cream Co. which the latter had just purchased.

He remained with the Western Dairy Co. until recently, and during the time spent in this development visited China

and the Philippines to investigate possibilities for the sale of ice cream in the Orient. During his connection with the Western Dairy, Mr. Stern installed the first 200 Nizer Cabinets in Seattle and personally serviced them for several months thereafter.

WARD PLANS PRODUCTION OF 15,000 UNITS IN 1927

Ward Electric Refrigerator Corp., which has recently completed the erection and equipping of a modern new plant on a six-acre tract at Buchanan, Mich., after having operated in Detroit for the past year, announces production plans which call for 15,000 units during 1927.

Dwellely Returns to Home Town to Address Northwest Dealers

Kelvinator dealers from all parts of the state of Washington met recently at the Hotel Gowman in Seattle. G. M. Dwellely, sales manager, Kelvinator Company, Detroit, made the trip to the Northwest and gave a spirited talk to the Washington state representatives.

Mr. Dwellely was welcomed back to his old home in Seattle, for it was in this city that he won national recognition for work with the American Multigraph Company. Among the dealers from Seattle represented at the meeting were L. C. Warner, of the L. C. Warner Company, distributors; P. K. Leberman and H. C. Philips, of the Radio Sales Corporation.

START MICHIGAN REFRIGERATION CO. AT GRAND RAPIDS

New Organization Takes Over Plant of Cheney Talking Machine Company

The Michigan Refrigeration, Inc., 1600 Monroe Ave. N. W., Grand Rapids, Mich., has been recently organized for the production of an electric refrigerator unit called the "El-Frig-Ette." The company is capitalized for \$1,500,000 and has purchased the plant formerly owned by the Cheney Talking Machine Co., with approximately 27,000 feet of floor space, and has 30,000 feet of vacant land for expansion.

The plant is well equipped for this type of work, and the company is just getting into production with a force of 50 men, which is expected to be increased to 200 men within the next 90 days.

The refrigerant used is ethyl chloride, and the machine uses a single acting compressor, inclosed in a leak proof housing. The machine operates with a pressure on high side of 18 to 24 pounds per square inch, and on low side with a 15 inch vacuum, which will take care of a box capacity of from 15 to 18 cubic feet maximum and designed for domestic use only. The low pressure under which the machine operates assures freedom from leaks, the manufacturers say.

The machine, designed by Walter Wachs, Chicago, Ill., has been in use for a period of five years. Mr. Wachs has been connected with the ice and electrical refrigeration industry for the past twenty years.

The officers of the new company are: Joseph Renihan, president; V. I. Cilley, secretary-treasurer. M. D. Greene is production manager.

OFFICE UNIT DISGUISED AS A FILING CABINET

Machine Operates Only At Night Thereby Avoiding Noise During Office Hours

An interesting novelty in electric refrigerator design was displayed for the first time at the annual Electric Refrigeration Show held at the show rooms of the New York Edison Company March 28 to April 9. A complete unit having the appearance of a standard two-section mahogany office filing cabinet was displayed by the Superior Iceless Refrigerator Co. of Cleveland, Ohio. It is intended especially for physicians, it is said, but visitors with a slight amount of imagination had no difficulty in visualizing a market for the outfit.

Looking at the cabinet casually, it appears to be two sets of four-drawer files. The two upper rows (four drawers) are in reality a large door, which opens outward on hinges at the bottom. The third row is actually one large drawer and when opened provides a support for the door above, which becomes a serving table. The lower row of "drawers" provides space for the operating unit.

The machine is not automatic, but is designed to be turned on at night for freezing a supply of ice cubes. In the morning the machine is turned off and remains silent during office hours, thus eliminating the objection to noise.

RECENT ADDITIONS TO WELSBACH COMPANY

R. R. Thompson, sales manager, refrigeration, Welsbach Company, Gloucester, N. J., announces the following appointments: A. A. Aldridge, branch sales manager at Pittsburgh; F. H. Ehnts, branch sales manager at Philadelphia; F. A. Janney, field representative in southern New Jersey; and W. R. McFadden, branch service manager at New York City.

CHAMPION ICER REPORTS INCREASED PRODUCTION

S. C. Bell, sales manager of Champion Electro Icer, St. Louis, Mo., reports an increase in production for the month of March of 50 per cent over that of February, and that the April increase will be 33 per cent over March. They have recently appointed Hess Brothers of Detroit as distributors for central Michigan.

Error in Everite Article

In the March 30 issue in the article "Everite Products Start Production," it was stated that the refrigerant used was sodium dioxide. This was an error and should have been sulphur dioxide. It was also stated that the secretary-treasurer of the company was J. A. Wharton. The correct spelling is J. A. Wortman.

Formed condenser coils
No possibility of scale. Free from hidden defects.
Up to 100 foot lengths. Write for prices.
1431 Central Ave., Detroit, Mich.
WOLVERINE
SEAMLESS COPPER AND BRASS TUBING

Causes of Food Spoilage

Requirements for Adequate Protection of Food Shown in Quotations from Government Authorities

By J. F. Hendrickson, Servel Corporation, and
C. B. Ryan, Jr., Welsbach Company

The first and foremost requirement of a refrigerator is that it accomplish actual refrigeration. This has been defined as "preservation of food-stuffs with the minimum alteration of desirable properties."

Leading scientific, medical and sanitation authorities are very well agreed on the conditions which cause alteration of desirable food properties. Decomposition, decay and fermentation are the commonest forms of alteration. Food which has undergone such alterations not only loses nutritive value, but it is injurious to the system and is highly dangerous for human consumption.

All students of the subject agree that these changes result from the action of tiny micro-organisms—living cells so small that they cannot be seen with the naked eye. Those which cause the alteration of food properties may be divided into three classifications. Some are friendly, others menacing. They are:

First. Molds.

Second. Yeasts.

Third. Bacteria.

All of them propagate very rapidly under favorable conditions. Warmth and moisture favor their propagate or multiplication. They do not multiply readily in cold, dry air.

Molds are known to most of us. When they develop in large numbers they are visible to the eye. We often see them on bread which has been kept too long. Conditions which favor the growth of molds also encourage the development of even more harmful microbes. There is always a grave danger that moldy food will introduce dangerous poisons into the system. Some molds are friendly and desirable, as the molds in Roquefort cheese.

Yeasts are also known to most of us. Certain forms of yeasts are produced commercially under scientific control. Some of the various cultivated yeasts are used to raise bread dough, to make synthetic buttermilk, and similar milk cultures.

Bacteria are the smallest and by far the most numerous of any of the microbes now under consideration. They absorb certain elements in foodstuffs, causing chemical decomposition. The food breaks down chemically, forming substances entirely unlike the original. Gases are released and carried off in the air, giving the food new odors. Eggs rot, meat becomes putrid; all foods so attacked spoil and decay. In addition to these decompositions products, the bacteria leave highly dangerous excretions in their wake—the "end product" that comes out after food has been passed through the bacterial digestive system.

Bacterial Development

A bacterium is a single cell. When it reaches full growth it divides into two cells. Each of these divides into two. Under favorable conditions this growth and division, this multiplication, takes place every twenty or thirty minutes. If this went on for some hours, the following stupendous multiplication would result:

One bacterium would produce:
After 1 hour 4 bacteria
After 2 hours 16 bacteria
After 3 hours 64 bacteria
After 8 hours 65,534 bacteria
After 15 hours 1,000,000,000 bacteria

This tremendous multiplication could actually happen if bacteria were provided with sufficient food; if they were not attacked by other organisms, even by unfriendly bacteria; or if there were no other influence to check their rapid growth.

Micro-Organic Incubation

It is an accepted fact, endorsed by bacteriologists and all who have made a study of the development and growth of micro-organisms, that microbes can multiply only in relatively warm, moist air. Most warm air, therefore, may be considered as an incubating medium. Dry, cold air, on the other hand, either prevents or checks their incubation or development. Countless scientific investigations and laboratory studies give unquestionable support to these statements.

Let us now determine the temperature at which air becomes an incubating medium. Probably the best authority on this point is the United States Department of Agriculture. No institution in the country is considered to be better equipped for a thorough investigation of this character, for a far-reaching laboratory survey and a dependable, accurate report of its findings.

Refrigerating Temperatures

In Farmers' Bulletin No. 1207, the Department of Agriculture declares that the temperature of the compartment in which food is stored must be kept at 50 degrees or less if rapid development of harmful bacteria is to be avoided. In other words, the Department states that 50 degrees is a critical dividing point. Above this temperature, bacterial growth is stimulated; below it is checked.

In dealing with the problems of spoiled milk, for instance, the Department makes this positive statement:

"If a thermometer placed inside the refrigerator registers more than 50 degrees, the fault cannot be laid entirely to the milk."

Dr. John R. Williams, a recognized authority on the sanitation aspects of refrigeration, stated to the Third International Congress of Refrigeration:

"Above 50 degrees Fahrenheit bacteria multiply prolifically. This means that foods favorable for the growth of bacteria, as milk, meat, etc., undergo very slight decomposition when kept at temperatures ranging below 50 degrees Fahrenheit, but above that temperature they spoil very rapidly."

If bacteria multiply rapidly at temperatures above 50 degrees, it becomes self-evident that the temperature within the refrigerator must not merely be reduced to 50 degrees, but that it must be kept at or below this point. In this connection, the Department of Agriculture has stated:

"Even a temporary rise in temperature . . . will help the development of bacteria."

Let us now consider the other aspect of bacterial incubation, the other factor which encourages and stimulates the development of microbes which bring about changes in desirable properties.

Necessity for Dry Air

Here again, we find all authorities agree. They all recognize that the multiplication of bacteria and other micro-organisms is stimulated by moisture and checked by dryness.

The Department of Agriculture, in Farmers' Bulletin No. 475, agrees with all other authorities when it states:

"Dampness is one of the requirements for bacterial growth."

Summing up the findings of all indisputable authorities on the subject, we find that the preservation of foodstuffs in a condition which does not threaten human health or strength is dependent upon two prime refrigerating conditions:

First: Proper food preservation cannot be accomplished in temperatures which rise above 50 degrees.

Second: Proper food preservation cannot be accomplished in moist air.

The household refrigerator, therefore, if it is to accomplish the purpose for which it is intended, must be capable of keeping in the food compartments a temperature lower than 50 degrees. Bear in mind that word "keeping." Remember that even temporary rises to higher temperatures will stimulate the growth of bacteria.

Not only must the refrigerator keep the temperature at less than 50 degrees, but it must also remove natural moisture from the air by which food is surrounded.

Another word worth remembering is that word, "remove." The air that goes into the box when a door is opened is not dry. If the development of microbes is to be checked it must be made dry.

Moist Air Carries Odors and Tastes

There is still another very good reason why the air within a refrigerator should be not only cold, but also dry. If the air is moist, some of its moisture condenses on the food. These little particles of water absorb the taste and odor of the food. They, in turn, are again absorbed by the air. The process is repeated on some other food. The moisture condenses. Part of the odor and taste absorbed from one are given to the other food.

Some foods are more liable to contamination of this kind than others. Milk, cream and butter, for instance, will very readily be tainted with the taste and smell of other foods.

This is one reason why such foods should be placed in the bottom of the refrigerator. Aside from the fact that they are more perishable and therefore should be placed into the coolest part of the box, in this part of the refrigerator they are also subject to contamination of taste and odor.

Minimum Desirable Temperatures

The same authorities who state so positively that desirable food properties will be altered in temperatures of more than 50 degrees, are equally positive in declaring that temperatures for domestic refrigeration should not fall below 40 degrees. Below this temperature there is a danger that some types of foods will begin to freeze, some are frostbitten, and still others undergo a definite chemical change.

Foods that have been subjected to these lower temperatures remain very well preserved so long as the low temperature is maintained. As soon as it is increased, however, they begin to spoil very rapidly. Most of us know this from experience. We know that when food is frozen and then thawed out again, it must be eaten

almost immediately, for in a very short time it will be unfit for human consumption. It very quickly becomes soft and flabby. Subjection to low temperatures destroys delicate flavors, too.

That is why so many people who try to economize by using a window-sill for winter refrigeration are pennywise and found foolish. What they save in ice bills, they lose in wasted food.

Winter Wastage

Large milk distributors, for instance, say that ten times as many bottles must be replaced for breakage in the winter as in the summer. The milk is kept in outdoor temperatures. It freezes. Somebody must pay for the cracked and broken bottles. That somebody, in the long run, is, of course, the consumer, who always pays for the wasted milk.

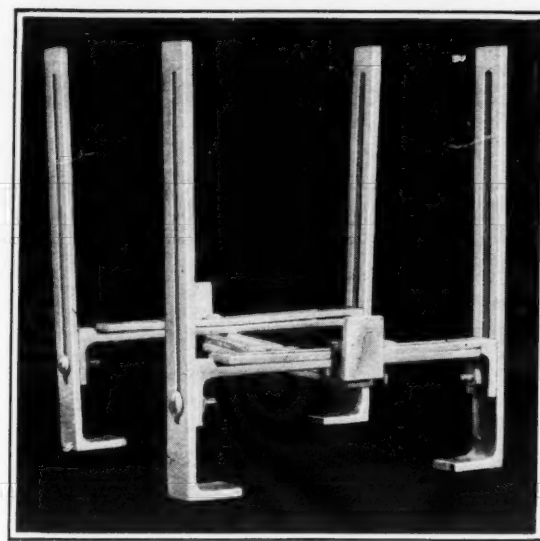
Some dieticians and household economists state there is actually more food lost in the colder months through spoilage in the home than there is in the heat of summer. So much of it is exposed to freezing temperatures and becomes unfit for the table.

In no section of the country are there many days of the year when outside temperatures are within safe refrigerating range—between 32 and 50 degrees. In the city of Chicago, for instance, there is an average of only 18 days a year when the thermometer ranges between these points. The average through the country, as a whole, gives less than 30 days out of the year when the outdoor temperature is suitable for preserving foodstuffs with a minimum alteration of desirable properties.

Adequate household refrigeration, therefore, is fully as important in winter as in summer—if, indeed, it is not even more important. Domestic refrigeration cannot be considered adequate to present needs unless it maintains a uniform temperature which never exceeds 50 degrees and never falls below 40 degrees, regardless of outside temperatures.

It is a winter and summer, day and night, 365 days a year necessity.

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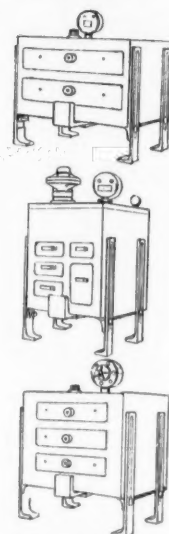


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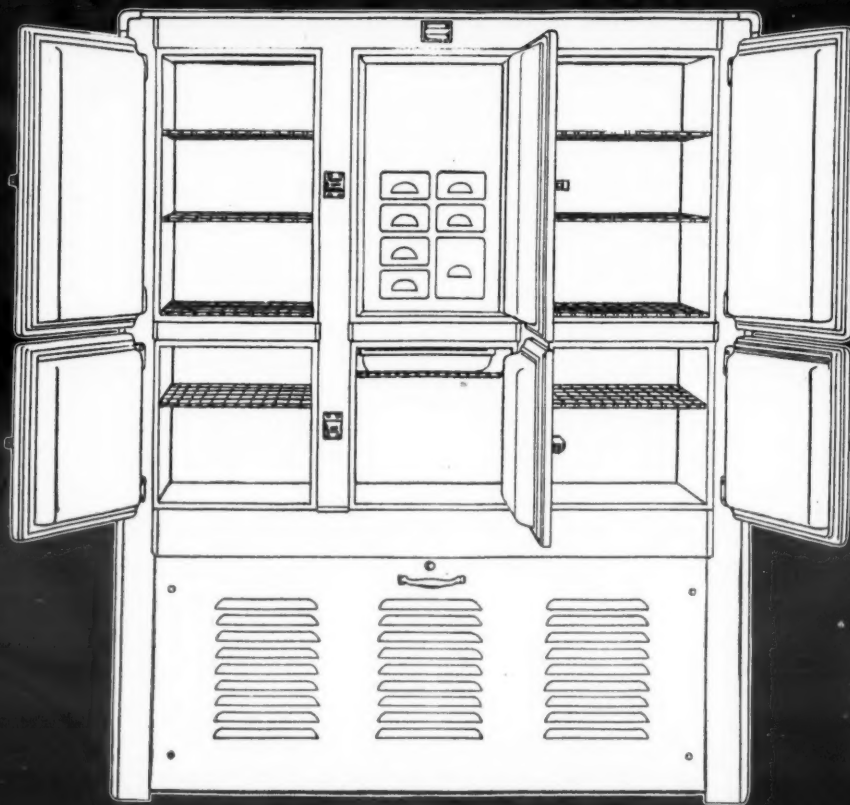
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COPELAND CS 16-23

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distributing organization for the man, or group of men, who can build and maintain a business in keeping with Copeland's nationwide success. Inquiries pertaining to Copeland franchise advantages will be held in strict confidence.

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What Point Has The Public Mind Reached In Regard To Electric Refrigeration?

By Roy George

Distinguishing between the line of electrical equipment that is still being sold and the line that is now being bought, Jack Arnold, of the Central Arizona Light & Power Co., Phoenix, Arizona, has maintained an interesting discussion among his salesmen over the position occupied by electrical refrigeration. He handles the Servel.

Where Are We Now?

"Personally, I find the line a staple. But, as some of the force point out, I am inside where the customers come to buy, while they are outside, where they go to sell. But the main thing is for every salesman to set his own dead line, according to his experience and the character of the territory he is working in, so that he will be putting his selling force, his salesmanship, directly on the point where salesmanship is needed and directly behind the articles that have to be pushed, and will be using his personality in spreading the gospel of good will toward the lines that sell themselves.

"Even as a matter of the salesman's own attitude of mind, it is important," thinks Mr. Arnold. "If a man thinks electric refrigeration is not yet getting across to the public in the right light, his best efforts should go into getting the idea across. If we have passed the point where the public has to be educated to accept the fact, then he must concentrate on selling food conservation, or on some other point higher up toward the closing in for the order.

"Right now, the country over, the point to be made, according to my analysis of

the situation, is that of health and economy in foods under a system of home refrigeration by electricity.

"The real benefits are only beginning to be half realized, and when considered in the aggregate it is a selling factor that has never been equalled since the world grasped the significance of the automobile. When the sales force engaged in selling refrigeration begins to bear down on this one point as it deserves, sales are going to jump spontaneously from the hundreds of thousands into the millions.

The Casual Shopper

"My experience has led me to believe that we have reached the stage where this point can be made through the contacts created in the day by day business in the stores. Inquiry has been focussed on electric refrigeration by national advertising and by house to house canvass. The good prospect right now is the shopper who stops to glance casually at an attractive unit that happens to catch her eye. Her question is usually the price.

"Give her the price, and call her attention to only one other thing: Food conservation and its effect in health and economy. Get your mind thoroughly attuned to this point. The public is already up to it. The season is here when such a concentrated effort will jump the volume of business in electrical refrigeration to unexpected proportions."

There is much lost energy in salesmanship by not properly realizing just what point public education has reached on a given object of merchandise.

REVIEW GROWTH OF ELECTRIC REFRIGERATION

(Continued from page 1, column 1)

the growth of electric refrigeration, Mr. Cockrell asserted. Previous to the advent of public interest in the new equipment, the cabinet business was laboring under the pressure of cut-price sales by department stores. The tendency was to make cheaper and cheaper boxes, and buyers were led to believe that price was the main consideration in the purchase of a refrigerator. Now attention is being focused on the requirements of good construction, and the cabinet industry is directing its efforts toward improvement in design and quality of workmanship.

Mr. Cockrell point out that the electric light and power companies which compose the "central station industry" see the electric refrigerator as an appliance of enormous potential value as a revenue producer. The electric refrigerator, because of its admirable characteristics as a continuous and even consumer of current, is by far the greatest device which has ever come into the hands of the public utilities. Due to the great benefits which electric refrigeration offers to the central stations, he said, these companies represent a stabilizing influence upon the electric refrigeration industry. The utilities are keen students of public opinion, and will see to it, more and more, that electric refrigeration is developed along sane and sound channels for the ultimate interest of the public.

Electric refrigeration has also benefited the manufacturers and dealers in other household appliances, Mr. Cockrell believes, because it has created a renewed and lively interest in electrical service in the home. Past experience shows that the family which invested in a \$150 washing machine was thereafter more insistent upon living in a electrically-wired home. The purchase of a lower-priced device produces only a casual interest in electric service as such. When the family allots \$250 to \$600 for the purchase of an electric refrigerator, however, it develops a positive affection for the comforts provided by electricity.

Mr. Cockrell closed his remarks with a plea for a friendly and constructive spirit among competitive manufacturers, distributors and dealers. With so small a part of the potential market now served with electric refrigeration, with the common problem of public and trade education confronting all companies, and with the vital need for public confidence and trust in the industry, it is folly for the companies in the business to fight each other.

Dr. Pennington, a government expert on the railroad transportation of food and author of numerous booklets devoted to the proper methods of using refrigeration, urged the industry to use its influence to bring about a better understanding of the need for good refrigerator cabinets in the home. Poorly constructed boxes, she said, do not provide food protection and must necessarily result in disappointment and dissatisfaction on the part of the buyer. She emphasized the necessity for adequate insulation of suitable materials and of proper thickness. Thin and cheaply constructed boxes are a menace to the industry as well as the home, in her opinion.

After the dinner and meeting the guests were taken in special busses provided by the courtesy of the New York Edison Company, to see the second annual electric refrigeration show in progress at the Fifteenth St. and Irving Place showrooms of the Edison Company.

Has Been Waiting 14 Years for Such a Paper

"I have been waiting the fourteen years I have been in the domestic refrigeration business for a paper like yours. I am sure its pages will help to guide the newcomers over and past the grief that the older men in the industry have gone through."—F. J. Heideman, Whitehead Refrigeration Co., Detroit, Mich.

SAN ANTONIO HAS BUILDING INSTITUTE

24 Periods of One Week Each Divided Among Building and Allied Trades

A home building institute is being held in San Antonio, Texas, under the auspices of the San Antonio Express and Evening News, which promises to be one of the most interesting events of its kind ever held in this city. The institute is divided into 24 periods of one week each, and each line of industry allied with the building trades has been allotted one of the periods in which to bring their message before the public.

The week beginning June 18 has been set aside for the display and discussion of electrical equipment for the home, and plans are included for showing the public the importance of electric refrigeration to the modern home.

The meetings are being held on the roof garden of the Builders' Exchange building, and thus far have aroused considerable interest. With this opportunity coming at a time when the public will begin to give serious thought to refrigeration, there can be no question but what the sales of equipment will be materially benefited.

\$1250 in Prizes Offered in Electro-Kold Contest

A contest staged by the Electro-Kold sales corporation, Spokane, Wash., will have as prizes \$1,250 worth of merchandise, with a complete Electro-Kold refrigerator, valued at \$250, as first prize.

The contest will have as its theme the reason why the Electro-Kold should be used in the home. Contestants are being urged to call at the office of the company on Stewart Street and inspect the refrigerators. H. F. Jahn is manager of the Seattle office.

New Million Dollar Hartford Apartment House Specifies Electric Refrigeration

Electric refrigeration is specified in the proposed \$1,250,000 apartment house to be erected on Brookside Avenue, West Hartford, Conn., by the Westford Green Corporation, 36 Pearl St., Hartford, Conn. Excavation work is to start at once and the general contract for construction has been awarded to the H. Wales Lines Company, 134 State St., Meriden. The building will be arranged for 30 apartments totaling 248 rooms, and the grounds will be developed for sunken gardens, artificial lake, etc. Plans for the apartment were prepared by L. B. Scheide.

Improved Marine Refrigeration Service Benefits Apple Growers

Increased refrigeration service to the continental European ports, as well as the Orient, on boats plying from Seattle, is regarded as a great stimulus to the apple industry of the northwest. Apple growers say the improvement in refrigeration service will permit the transportation of apples for longer distances, widening the foreign markets for this fruit, which is a mainstay of both Oregon and Washington.

Fred Allison, Ford Engineer, Joins Van Deventer Organization

Fred Allison has resigned as chief electrical and mechanical engineer of the Ford Motor Company and will now engage in consulting engineering work through H. R. Van Deventer, Inc., 342 Madison Ave., New York.

Mr. Allison has been connected with the Ford industries for over twenty years and has a widely diversified experience in mass production methods. He is said to have control of a considerable number of patents covering production equipment originated by him, and that he is in a position to grant licenses to manufacturers in other industries. It is reported that Mr. Allison now intends to direct his efforts toward electric refrigeration.

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We have an agent, with our product in stock, near you
Wire us where we can serve you

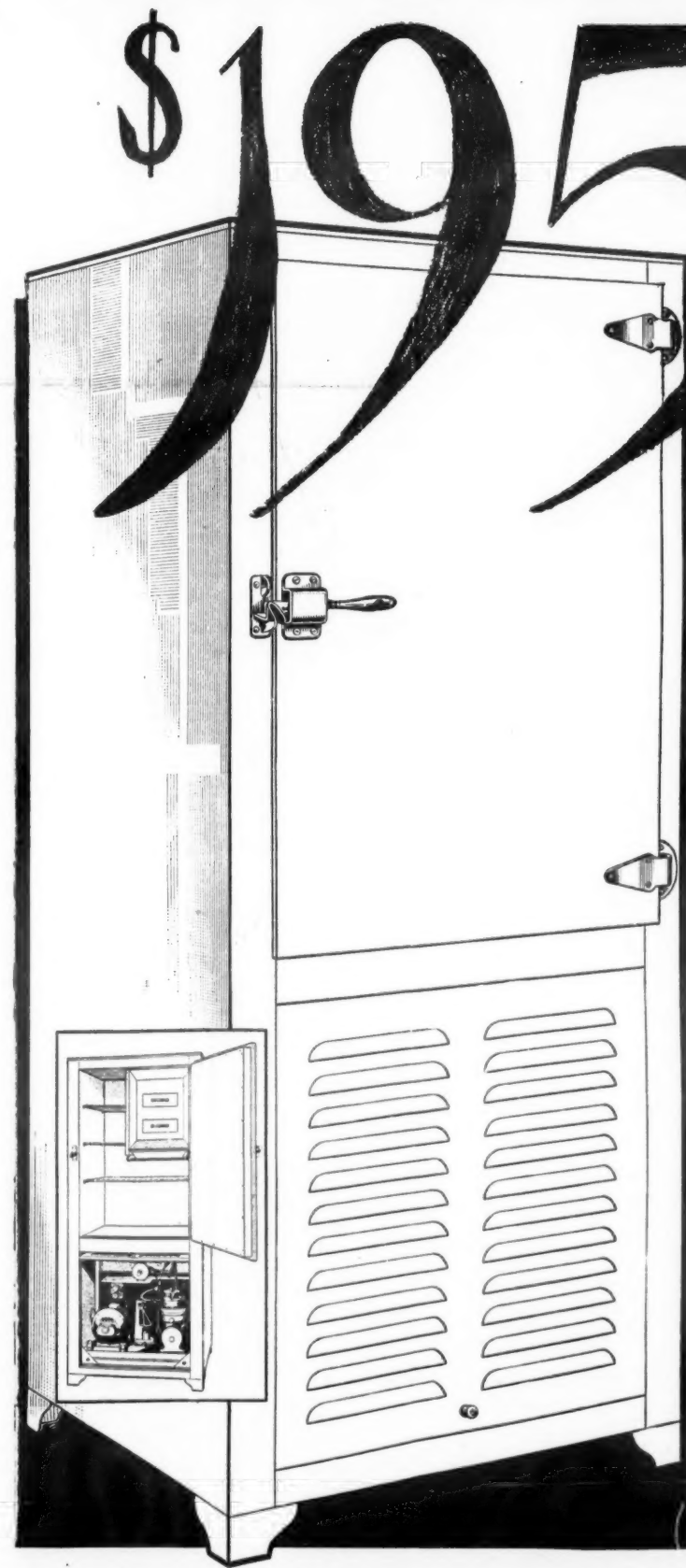
VIRGINIA SMELTING CO., WEST NORFOLK, VA.

F. A. EUSTIS, Secretary

131 STATE ST., BOSTON

2 RECTOR ST., NEW YORK

POLARIS



F. O. B. Logansport, Indiana

GEM

America's Greatest
Buy in
ELECTRIC
REFRIGERATION

[SPECIFICATIONS]

FOOD STORAGE SPACE: 5.3 cubic feet; 8.06 square feet.
EXTERIOR DIMENSIONS: 59 3/4 in. high, including glides; 25 7/8 in. wide; 22 9/16 in. deep.
NUMBER OF TRAYS: Two for making ice and frozen desserts.
ICE MAKING: 56 one and one-fourth in. cubes—approximately 6 pounds of ice at one time, or about 50 lbs. per day.
CABINET: Exterior: Steel, luster lacquer finish, one piece type construction. Interior: Steel, finished in white enamel.
HARDWARE: High grade brass, heavily nickel plated.
SHELVES: Heavy wire, hot tinned after fabrication.
GASKETS: Cork gaskets are used where food compartment lining is fastened to frame-work. Pyrolin gaskets are used under all hardware and shelf hooks. Wire's patented "Airtight" Cushion Gaskets are used around all door openings.

Arrangement of Materials Used in Construction of POLARIS-GEM Cabinets

SIDE WALLS: A cross section of the side-wall going from the outside in will reveal the following materials:
1. A layer of 22 gauge alloy coated steel.
2. One-half inch of air space.
3. A layer of water-proof paper.
4. A layer of 1 1/2 inch corkboard with joints filled with Hydrolene.
5. A layer of waterproof paper.
6. The food compartment lining finished in white enamel.
TOPS AND DOORS: Same as given above for the side walls, excepting there is no air space.
BACK AND BOTTOM: Working from the outside we have the following arrangement of materials:
1. A layer of 24 gauge galvanized iron, finished in white.
2. A layer of water-proof paper.
3. A layer of corkboard insulation 1 1/2 in. thick (2 1/2 ins. thick in bottom).
4. A layer of waterproof paper.
5. The food compartment finished in white enamel.

No
Installation
Required



No
Expert Service
Necessary

A Complete Line of Household Electric Refrigerators

Finished—tested—inspected and ready for use when

shipped from the factory

We solicit inquiry from dealers and distributors. Write us today for our agency proposition. Address

Polaris Electric Refrigerator Company

Established 1921

LOGANSPORT, INDIANA

ELECTRIC REFRIGERATION NEWS

The Business Newspaper of the Electric Refrigeration Industry

PUBLISHED EVERY TWO WEEKS BY
BUSINESS NEWS PUBLISHING CO.

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APRIL 13, 1927

Who Started It?

WHEN the Electric Refrigeration Committee of the National Electric Light Association presented its favorable report at the convention in San Francisco two years ago and thereby put the official seal of approval of the central station industry on this new application of electric service for the home, the said committee started something.

The embryo industry had been getting ready, it is true, for twenty years. During all this period speculative business minds turned to electric refrigeration again and again with a view to testing out its possibilities for commercial development. Numerous tests were made, but always something was lacking. The time was not yet ripe.

Then suddenly something happened. The flood of pent-up interest in electric refrigeration broke loose. Everybody began talking about it. Large advertisements appeared in magazines and newspapers. Enormous sums were subscribed to launch new companies. Stock quotations soared. Production was speeded up. Sales jumped. The time had arrived.

History Repeats Itself

WHAT was it that happened to cause so much activity after so many years of waiting? Simply a repetition of what happened to the incandescent lamp, the electric iron, the washing machine, the electric range. The central station industry finally got ready, in its own peculiar way, to say "go!"

The central station industry said "go" and everybody who had a machine (and who heard the signal) jumped in and the race was on. Some were not quite ready, but there was no time to wait. Perhaps one had an eye on the starter's trigger finger and thereby got off for a flying start. But another had more gas in the tank and soon caught up. One or two forgot to take a pair of pliers and a screw driver along. There has been no lack of excitement.

An Important Event Coming

THE next convention of the National Electric Light Association is scheduled to be held in Atlantic City June 4 to 10. The Electric Refrigeration Committee will again report but this time its findings will be based upon two years of strenuous experience. What will the committee have to say?

One guess: The committee will have no doubt about the value of electric refrigeration as a service to the public or its possibilities as a load builder for the central station. Another guess: The committee will devote some attention to the subject of "service." A third guess: The committee may make a few remarks about motors. Make a few guesses yourself.

A Guarantee of Stability

THIS will be the fiftieth annual convention of the N. E. L. A. It is an old and seasoned organization. Its affairs are directed by serious minded men who know their kilowatts. The vital interest of the central station industry in the proper development of electric refrigeration represents a guarantee that electric refrigeration will continue to grow and expand, providing that manufacturers, distributors and dealers keep faith with the public.

It is extremely important that the financial, operating and commercial executives of the central station industry be continuously and adequately informed regarding the detailed development of electric refrigeration, the merits of the various types of equipment and the facilities of the various companies for rendering satisfactory service.

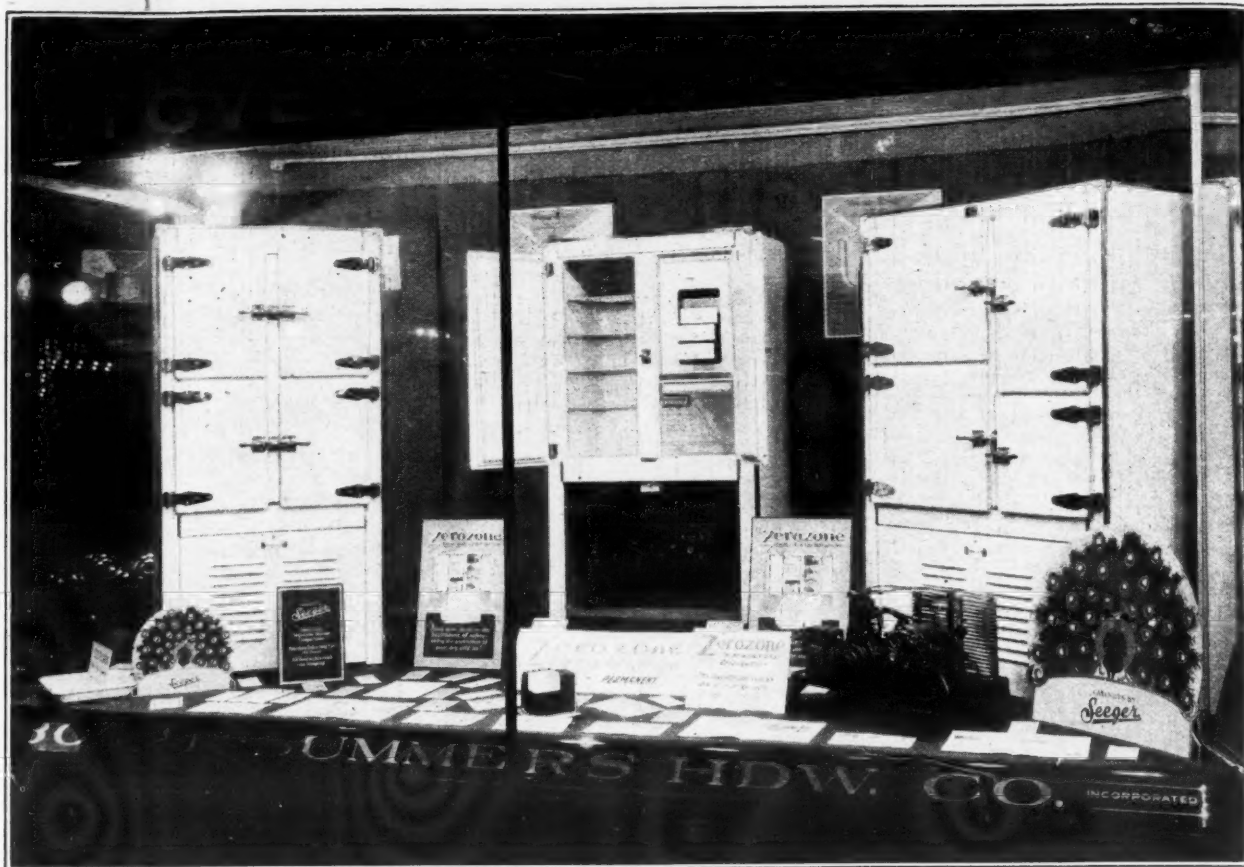
In laying out the editorial and circulation plans of ELECTRIC REFRIGERATION NEWS the needs and interests of the central station field have been constantly kept in mind. The paper has already gained the attention of many of the key men because of its specialized and comprehensive treatment of this one subject having such great possibilities for the advancement of their own business.

Electric Refrigeration Exhibit

AT Atlantic City the electric refrigeration exhibit will probably be the outstanding feature of the exposition, although other phases of electrical service will make a strong bid for attention. The status of electric refrigeration in the market development programs of the central stations during the coming year, may be determined to a large extent by the impressions gained on this occasion.

Manufacturers and distributors of electric refrigeration equipment, particularly those who must determine the sales and service policies, and even more particularly those who are new in the electrical industry, should arrange to attend the sessions of the convention from Monday to Friday, June 6 to 10, and the exhibition which will open on Saturday, the fourth.

Louisville Hardware Dealer Features Electric Refrigeration



This window of Bomar-Summers Hardware Company, Louisville, Ky., showing the mechanism of the Zerozone and the shining immaculateness of the Seeger cabinets halts most every housewife that

passes and sends many inside the store with interested inquiries.

A card beside the machine says: "Zerozone can be installed in your refrigerator. This operating unit is usually placed in

the basement. Silent and efficient." A corner cross section of a cabinet placed in the center near the front calls attention to the construction of Seeger refrigerators.

Are Central Stations Peculiar?

Electric Light and Power Companies' Position Explained by
Chairman of N. E. L. A. Refrigeration Committee

By H. E. Young,
Northern States Power Company,
Minneapolis, Minn.

From a recent editorial in your paper I take it that manufacturers and others interested in electric refrigeration think that electric light and power companies are a peculiar lot.

Manufacturers, recognizing the interest which electric companies should have in the additional sale of current resulting from electric refrigeration, take it for granted that every such company should jump into the game of boosting electric refrigeration in every way. It is hard for such manufacturers to understand the red tape, indecision, caution, and apparent backwardness which some, if not most, electric light companies manifest when they approach them to boost the sale of their product.

Perhaps we are an odd lot.

A recent editorial in the ELECTRIC REFRIGERATION NEWS certainly was calculated to cause us to take stock and see whether our industry was taking the right attitude. If we are not, it is safe to assume that we are only too anxious to revise such attitude, as the promotion of the use of electric refrigeration is of vital interest to us.

Can't Forget the Past

One reason why possibly we view this matter from a little different angle than most others now engaged in it, is the fact that most of the individuals so active in electric refrigeration at the present moment have been connected with it for only a very few years—one to four years would probably cover 99% of those now connected with it.

On the other hand, we have had it under close observation for fifteen years. During that period we have seen innumerable models of electric refrigeration machines come and go. It might be confessed that in past years our eagerness to see this idea developed has caused many of us to attempt to get behind some make of machine, and as a result we have gotten our fingers burned.

While different makes of machines can come and go, we go on forever. We are obliged to continue doing business at the same old stand. We are obliged to live with the customers and with the public that we have been dealing with, and every ralse move we make rises up to haunt us for years afterwards.

Therefore, an electric light and power company which sells or recommends any such equipment is in quite a different position than a private dealer, since the electric light and power company has for its customers practically every household.

We have seen private dealers do quite a flourishing business in this kind of equipment in years gone by, and when it turned out to be a failure, wash their hands of it and go complacently on their way not much the worse for the experience.

Needless to say, an electric light company would hate to think of what they would have to face if they sold an appreciable number of machines of this kind. It would not be so easy for them to wash their hands of the situation.

All this by way of explanation that if we



H. E. YOUNG
Chairman, Electric Refrigeration Committee, National Electric Light Association.

seem peculiar there are, in turn, peculiarities to our business.

No Lack of Interest

Our attitude, however, based upon past experience and upon the peculiarities of our business, should not indicate any lack of interest on our part.

On the contrary, we are extremely interested and we are constantly studying ways and means wherein we can be of the greatest assistance in promoting this business and co-operating with everyone engaged in it, while at the same time conforming to the rather strict requirements of our own business and our position in the community.

Our industry has had a committee studying this matter constantly for the past four or five years. We have gathered the experiences and the opinions of electric light companies all over the North American continent for the purpose of enabling our industry to take advantage of all that has been done and all that can be learned.

No manufacturer, distributor, agent or dealer need think that the electric light and power industry is not quite as inter-

ested in the success of electric refrigeration as he is.

All of these agencies in the electric refrigeration game should feel free at all times to consult with and call upon any member of our industry for their support and co-operation, and if there are any signs of caution or reluctance they will be found to be readily explained by the above facts.

Numerous Methods of Co-operation

It should also be remembered that our industry does not think and feel as a unit in the matter of details of co-operation and promotion. Each company thinks for itself, while at the same time striving to gain by the experience of other companies. For example, some companies feel they should not sell electric refrigeration equipment at all, but should work out some method of co-operating with all dealers.

Other companies think they should handle and sell a number of makes of equipment—all the leading makes, if possible.

Others think they should sell one make, introducing sufficient healthy competition to keep the public interest and help thereby to create the maximum possible demand for the benefit of all makes.

It is safe to say that no electric light and power company wants to so dominate the field in the matter of sale of equipment itself as to discourage or not affect the maximum inducement for other agencies to engage in the business.

With an average of only 2% saturation it is evident that the field is so unlimited that a very high degree of intensive sales effort is necessary to even arouse the necessary interest and create the necessary demand to make a market in which other dealers and agencies can profitably operate.

While most electric companies appear to be over-cautious, as the editorial in the ELECTRIC REFRIGERATION NEWS indicated, still this is by no means universal, as we sometimes feel some companies go too far.

By this we mean that some companies have gone ahead actively selling a particular make of machine without properly ascertaining whether it was thoroughly developed. Other companies have pushed the sale of a particular make so vigorously, given such liberal terms of payment, that some feel it has acted to discourage other dealers—while, viewing it from another standpoint, it might be argued that such methods are necessary during the pioneering stages to get enough machines in operation to put the business on a basis where a sufficient market is created to attract other dealers.

Whatever methods may be employed, however, it is safe to assume that the maximum growth and prosperity of the refrigeration industry is the desire of our industry, as it is self-evident our interests are thoroughly mutual in this respect.

Further Development Necessary

This means, of course, that unless this development is based on a sound foundation, development will be stifled.

If over-eagerness results in making mistakes such as to cause the public in general, or any local community, to lose confidence in electric refrigeration, it will cost time and money to restore this confidence.

Some think electric refrigeration is being pushed too fast. Certainly many millions of dollars are being poured into the development of this industry, depending almost entirely upon its future success for profits.

(Continued on page 5, column 3)

Lancaster Dealer Gives Systematic Office Aid to Outside Salesmen

By Thos. H. Wittkorn

How to help the outside salesman get his prospect for an electrical refrigerator into the store has been receiving the attention of the Evans Electrical Company, Lancaster, Pa. Unfortunately he cannot carry the machine with him from door to door, so Alma Hershey, secretary of the company, has worked out a plan which is giving good results.

The start is made by having the salesmen get the name and address of his prospect. At the first interview he also tries to have her promise to come into the store to inspect the stock, if he cannot make a sale.

As soon as possible after the name comes into the office, a letter is written thanking the prospect for the time given to the salesman, also calling attention to the piece of literature enclosed and extending an invitation to call and inspect the display.

If the first letter brings no response, as is frequently the case, in a week or ten days at the latest another one is sent. This is also a personal letter with a different piece of literature. It refers to the previous letter and enclosure, tells how good the refrigerator will keep foods, and the value of its low temperature, and closes with another invitation to call at the store.

The second letter has been successful in bringing many prospects into the store. It

has also established a contact with many others who cannot resist its human appeal and who call on the telephone to say that they are not interested at present or to ask about prices.

If neither of the letters brings a response, a third one is sent a week after the second. It also has a strong personal appeal and carries a book of recipes showing colored pictures of fancy desserts. It appeals to the housewife's desire to serve attractive foods. Many of those who are financially able to buy a refrigerator will come into the store to learn about prices and terms.

No letter in this series is long—three or four paragraphs are sufficient; each is as personal as possible, has a different appeal and none mention price. The manufacturer supplies the enclosures so the cost to the dealer is nominal, and the returns are far beyond what come without the effort.

Miss Hershey has found that while the letters are going out it is best not to have the salesman call on the prospect. Of course, this is subject to exceptions, but in general better results have come to the firm when sales are not unduly forced, especially in the case of delayed payment business. One dissatisfied customer, she has found, will do more harm than can be overcome by ten satisfied ones.

Electric Refrigeration Offers Market For Sheet Steel

If the electrical refrigeration industry is to develop to its full possibilities as a market for sheet steel, it will be through the closer study, by both industries, of the special requirements which the refrigerator cabinet presents. This is the view of The Superior Sheet Steel Company, Canton, Ohio, which has developed two special types of sheet which are, it is stated, specifically adapted to cabinet manufacturing operations and the conditions under which refrigerator and ice cream cabinets are used.

These sheets, Super-Metal and Galvannealed, are so greatly alike in features which are of special importance to the cabinet manufacturer as to be classed as two grades of a like material. Their coatings are of special, rust resisting alloys which are made to amalgamate with their base metal and retain a soft, ductile composition which may be formed by high speed production methods without fracture or peeling of the protective coat. They may also be stretcher leveled for absolute flatness after the coatings have been applied.

Another feature of these coatings is that they offer a fine, porous surface to which lacquers and enamels adhere with great tenacity. Super-Metal sheets are recommended by the manufacturers for the finest cabinets because of their highly polished finish which requires little or no preparation before lacquering or enameling.

It is expected that other manufacturers of sheet metal will give special attention to this new market which has sprung into importance during the past five years.

Need for Electric Power on the Farm

An address before the Academy of Political Science at its annual meeting, on "Problems of Prosperity," in New York, November 17, 1926, by Arthur Williams, vice-president, New York Edison Company, published by the Academy of Political Science, Fayerweather Hall, Columbia University, New York.

"Solution of the problem of providing abundant and cheap power to the farms seems closely analogous to the corresponding problem now in course of favorable and economic solution concerning the reconstruction of the country's highways, over which the farmer brings his produce to his shipping points or purchasing market. Without passable roads, he could not deliver his products; likewise, without corresponding electrical highways, he cannot receive from the power plant the energy he requires for his home and barns. Just as highways have been provided for vehicles, so highways must be provided for kilowatts and kilowatt hours. It is an economic, not political question.

Of Greatest Importance to the Nation
"The solution of the problem is of paramount importance, not only in the civic, but in the economic life of the nation. With ample power, life and work on the farm would become more attractive, possibly supremely attractive compared with many other activities; the supply of food of all kinds would be more efficiently obtained, the value of farm realty would be increased, net farm income and profit would be enhanced, and the cost of food might be ultimately reduced; farm effort would be accompanied by greater certainty of results in production, and the individual as well as the group would be protected in many respects against retarding or

destructive agencies; farm employment would encourage and develop a highly efficient and desirable character of farm personnel.

Some Statistics, Actual and Estimated
"There are now 6,372,263 farms in the United States; 452,620, or 7.11%, have either gas or electric service; 225,000 of this number, or 3.53%, are connected with electrical central stations. Thus, it will be apparent that almost 93% of the farms of the country are without power in either the homes or for the outbuildings, and more than 96% are without central power plant service.

"About 31,240,000 of the country's population live on farms. Farm workers not living on the farms on which they work are not included, but one must assume that their home conditions are no better in character. Probably more than 35,000,000—possibly a full third—of the American population live on farms and under farm conditions.

"The realty value of American farms, including land and buildings, is approximately \$50,000,000,000 (\$49,564,523,759); the total value, including machinery and livestock, is in excess of \$58,000,000,000 (\$58,443,000,000); the present annual value of farm products is more than \$13,000,000,000 (\$13,031,000,000). The cost of labor in 1919 was \$1,098,694,590, and for 1920, including the estimated value of board furnished was \$1,356,403,452. It is probably much higher today."

Old Mother Hubbard Window Display Theme

Frigidaire Poster Service Offers Revised Version of Mother Goose Rhyme

The A. V. Thompson Company, Louisville distributors for the Frigidaire, have an interesting window display. The entire window is draped in green and brown velvet curtains, inside of which is a big gold frame in which stands a life-sized cardboard figure of Old Mother Hubbard and her dog beside a Frigidaire. Across the top of the figure is written:

"Old Mother Hubbard,
Now needs no cupboard.
With her new Frigidaire
Good food's always there."
"Mother Hubbard Up to Date," is the subject of the second March display furnished by the advertising department, window display division, of the Frigidaire Corporation. The Dealers' Poster Service and Stageette Setting shows three suggested displays, including one for a small window with insufficient space to permit the use of an actual refrigerator. Posters are used in standard frames provided by the manufacturer.

Electric Refrigeration Specified For New Plant of Bridgeport Produce Dealer

Leonard Asheim, architect, Court Exchange Building, Bridgeport, Conn., has been commissioned to prepare plans for a wholesale fruit and vegetable plant for L. Bernstein & Sons, wholesale dealers of 516 Water St. Plans will be ready for bids the latter part of April and will include specification for an electric refrigerating unit.

Needed for Years

"I also want to congratulate you on your fine paper, for it is something the trade has needed for years."—L. K. Wright, 602 Academy St., Astoria, Long Island, New York.

ARE CENTRAL STATIONS PECULIAR?

(Continued from page 4, column 5)

little or no profits having been derived therefrom as yet.

We all hope, in fact, we are all confident, that on the whole this money is being well spent and that the future of the industry is assured, but it is safe to assume that there are many individual instances where mistakes will be made which will hamper the growth and development in such cases.

We all want these mistakes to be as few as possible, and the development to be hampered as little as possible.

Each electric light and power company is especially anxious that none of these mistakes take place in the community in which it operates.

Our Industry Appreciative

In closing, let me state that the electric light and power industry is appreciative of all the brains, talent, inventive genius, capital, executive and sales ability which the electric refrigeration industry has contributed to the promotion of electric refrigeration.

We are indeed glad to learn wherein we can employ any of the methods which go to make for its success. We want to unceasingly endeavor to give every corporation to its success.

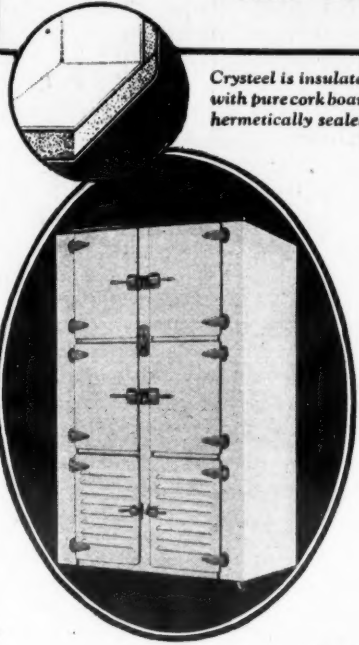
We look forward confidently to seeing electric refrigeration one of America's great industries.

Kelvinators Installed in New Hartford Apartment Houses

The Kelvinator-Lathrop Company, Hartford, Conn., report recent contracts including a 15-apartment house on Farmington Avenue for Kenyon & Molans, and a 10-apartment house at Adelaide St. and Wethersfield Ave., for J. M. Clarke.

Here's a question to ponder:

"How many service complaints can be charged to a poor box instead of the fault of your unit?"



Crysteel is insulated with pure cork board hermetically sealed.

YOU may have the best unit in the world, but if it's installed in a box that won't stay cold, the refrigerating plant gets the blame. And the customer whose compressor works overtime is a disturbing element on prospects.

Many electric refrigeration dealers see the wisdom of giving the unit every possible help. These men are lining up with Crysteel Cabinets—the line that is built expressly for electric refrigeration.

The Crysteel Cabinet is a work of art. It sells the wife on its beauty and the husband on its design and economy. It is an aid to the sale of the unit and is built in sizes from 5 to 20 cu. ft. capacity, each with a dome light inside.

Exclusive franchise with local advertising paid for by the factory granted to dealers who can qualify. Write for details.

BENJAMIN ELECTRIC MANUFACTURING COMPANY
120 S. Sangamon St., Chicago

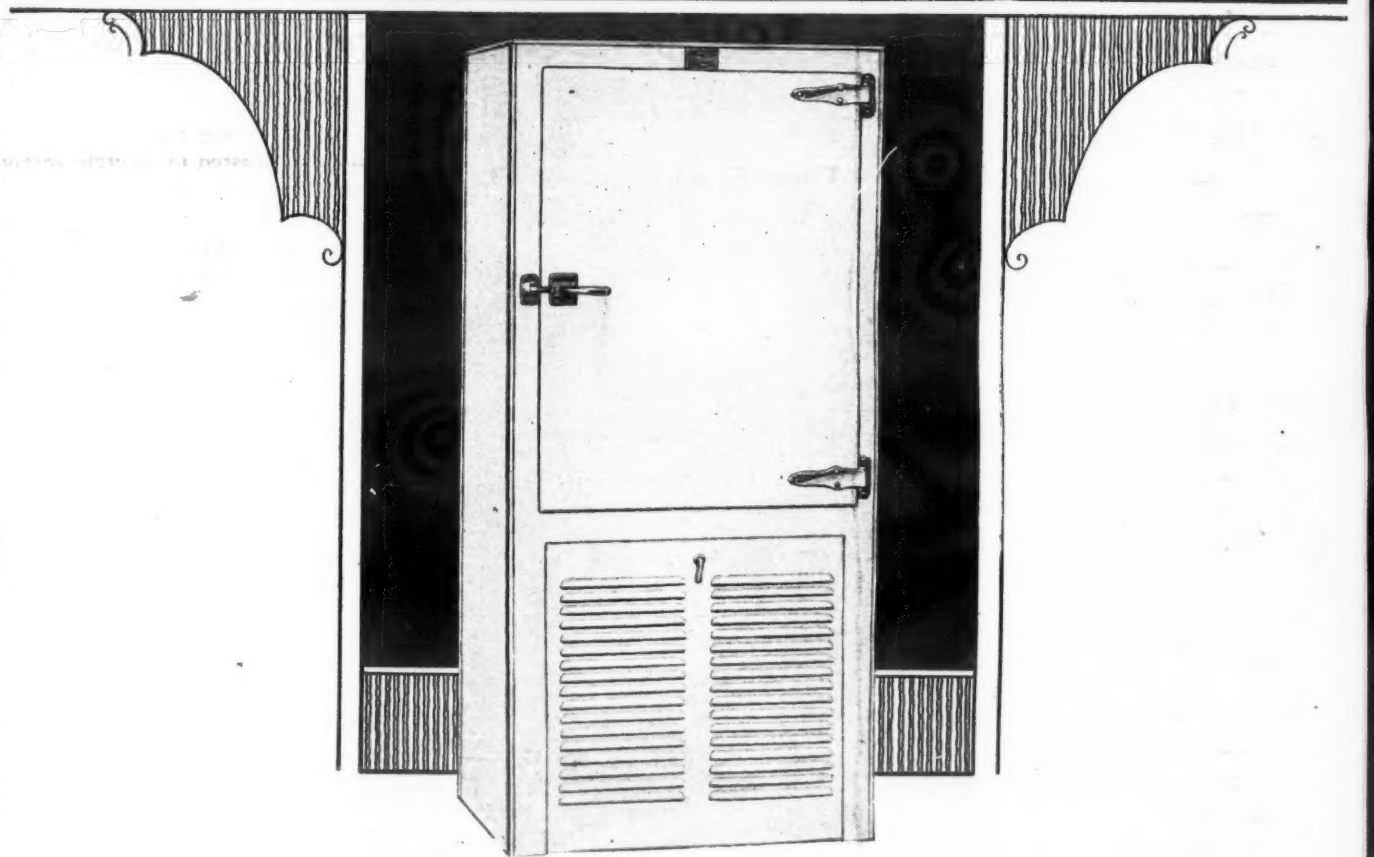
BENJAMIN

Crysteel

All Porcelain Cabinets

CRYSTEEL CABINETS DID NOT JUST HAPPEN, THEY ARE MADE THAT WAY

QUALITY TRIM DENOTES QUALITY THROUGHOUT



Copeland

Another quality refrigerator with Monel Metal trim

A high-grade refrigerator deserves a high-grade trim. For even though it is built of the finest materials with painstaking care, it will not be accepted as a quality product unless it has the appearance of quality. Leading refrigerator manufacturers are therefore using Monel Metal trim because:

1. It has a permanently bright attractive surface—it dresses up the refrigerator.
2. Its corrosion-resistance makes it easy to clean and keep clean.

3. It is inherently rugged—hard to dent or scratch.
4. It has no coating to wear off.
5. Its permanent ornamental value helps sell the refrigerator.
6. Last, but not least: It is available in ample quantities in desired dimensions, shapes and forms.

IMPORTANT: Refrigerator buyers are being taught to recognize a quality refrigerator by its Monel Metal trim.

Monel Metal is a technically controlled Nickel-Copper alloy of high nickel content. It is mined, smelted, refined, rolled and marketed solely by The International Nickel Company. The name "Monel Metal" is a registered trade mark.

Monel metal

THE INTERNATIONAL NICKEL COMPANY (INC.), 67 WALL STREET, NEW YORK CITY

Electric Refrigeration Patents

A Classified Record of All Electric Refrigeration Patents Issued
Up to January 1, 1927—Fourth Installment

Compiled by H. R. Van Deventer

The United States Patent Office classifies all issued patents according to subject matter, and in accordance with an Official Classification. The patents pertaining to refrigeration are contained in one major class, which is in turn divided into 178 sub-classes.

These sub-classes include in addition to the iceless refrigeration machines and processes, other sub-classes pertaining to ice refrigerator boxes and ice buildings, cars, ships, and wagons, and also systems of air cooling such as are used in theaters and public buildings. There is also included sub-classes on automatic control of the iceless machines.

Following is the fourth installment of the complete list of all patents contained in the Official Sub-classes on iceless refrigeration machines and automatic control. The definitions appearing at the head of each sub-class are those officially given thereto by the United States Patent Office.

Sub Class 109

Ice Making Apparatus, Atmospheric

Apparatus for making ice in cold weather by subjecting water to the atmosphere without artificial cold producing apparatus.

1,240, J. E. Manuel	July 12, 1839
49,887, Keller & Henderson	Sept. 12, 1865
101,405, Velt & Fagan	Mar. 29, 1870
112,409, T. J. Bigger	Mar. 7, 1871
112,726, O. Lugo & J. B. McPherson	Mar. 14, 1871
126,109, L. Townsend	April 23, 1872
152,914, S. J. Newsham, W. H. Haines & W. S. Henson	July 14, 1874
160,601, S. Krauss	Mar. 9, 1875
174,833, T. B. McFadden	Mar. 14, 1876
177,717, B. Hoppeny	May 23, 1876
240,396, W. W. Dusenbury	April 19, 1881
250,235, O. Guthrie	Nov. 29, 1881
253,790, A. Von Krause & M. Kuhn	Feb. 14, 1882
255,660, O. Parker	Mar. 28, 1882
258,566, W. W. Dusenbury	May 30, 1882
Re 10,283, O. Guthrie	Feb. 8, 1883
275,192, G. W. Goodell	April 3, 1883
275,699, C. Pohlmann	April 10, 1883
276,508, A. Von Krause	April 24, 1883
278,085, J. Bowes	May 22, 1883
419,918, J. W. Brook	Jan. 21, 1890
423,306, J. W. Brook	Mar. 11, 1890
485,805, J. M. Rosse	Nov. 8, 1890
548,356, M. B. Eaton	Oct. 22, 1892
587,840, J. H. Martin	Aug. 10, 1897
609,814, G. Koser	Aug. 30, 1898
651,963, E. R. Butler	June 19, 1900
660,771, O. Guthrie	Oct. 30, 1900
660,772, O. Guthrie	Oct. 30, 1900
675,965, W. B. McCroskey	June 11, 1901
738,761, W. G. Bloss	Sept. 15, 1903
738,762, W. G. Bloss	Sept. 15, 1903
856,234, F. Eckart	June 11, 1907
921,370, W. Degener, Jr.	May 11, 1909
958,601, W. F. Johnson	Feb. 28, 1911
1,247,821, J. Graf	Nov. 27, 1917
1,339,659, J. McCoy	May 11, 1920
1,483,459, H. G. Lane	Feb. 2, 1924
1,496,625, N. Coate	June 3, 1924

Sub Class 110

Ice Making Apparatus, Atmospheric, Tank

Atmospheric ice making apparatus having a specially constructed tank, with means for freezing by the natural cold of the atmosphere, including features involving more than a tank structure.

1,941, T. B. Smith	Jan. 23, 1841
40,551, J. H. Bunnell	Nov. 10, 1863
80,063, R. S. Egbert	July 21, 1868
85,781, B. T. Babbitt	Jan. 12, 1869
108,816, S. J. Newsham, W. H. Haines & W. S. Henson	Nov. 1, 1870
160,713, E. C. & R. H. Negley & J. Cunningham	Aug. 17, 1875
182,090, C. Whitaker	Sept. 12, 1876
200,605, W. R. Close	Feb. 26, 1878
219,121, H. J. Slee & E. K. Goss	Sept. 2, 1879
230,318, J. W. Miller	July 20, 1880
255,660, O. Parker	Mar. 28, 1882
386,383, R. Connable	July 17, 1888
423,305, J. W. Brooks	Mar. 11, 1890
622,860, P. Martin	April 11, 1890
663,426, M. B. Eaton	Dec. 11, 1900
743,126, A. E. Wilson	Nov. 3, 1903
931,112, A. Ballard	Aug. 17, 1909
932,329, J. F. Rogers	Aug. 24, 1909
986, 835, J. H. Lewis	Jan. 14, 1911
1,068,405, J. A. Aubol	July 29, 1913
1,068,729, L. L. Wilson	July 29, 1913
1,127,104, J. F. Southern	Feb. 2, 1915
1,163,472, E. Seavey	Dec. 7, 1915
1,166,770, W. Latham	Jan. 4, 1916
1,268,188, R. C. Sinks	June 4, 1918
1,311,723, T. Swanson	July 20, 1919
1,335,538, O. B. Emerson	Mar. 30, 1920
1,428,892, W. Latham	Sept. 12, 1922

Sub Class 111

Ice Making Apparatus, Separator

Ice making apparatus having means for cutting or separating ice from the freezer.

8,080, J. Gorrie	May 6, 1851
108,816, Newsham, Haines & Henson	Nov. 1, 1870
177,999, J. F. Gesner	May 30, 1876
235,813, T. L. Rankin	Dec. 21, 1880
239,606, C. C. Palmer	April 5, 1881
248,157, C. W. Gelett	Oct. 11, 1881
261,810, T. Cook & O. Albrecht	Jan. 2, 1882
Re 10,522, C. P. G. Linde	Sept. 16, 1884
508,819, L. Daft	Nov. 14, 1893
530,526, D. L. Holden	Dec. 11, 1894
546,085, J. B. Wood	Sept. 10, 1895
567,538, T. H. Flynn	Sept. 8, 1896
587,840, J. H. Martin	Aug. 10, 1897
654,576, G. H. Abrams	Nov. 2, 1902
699,856, E. Stutz	May 13, 1902
842,147, D. J. Havenstrite	Jan. 22, 1907
856,234, F. Eckart	June 11, 1907
868,495, T. Shipley	Oct. 15, 1907
882,224, E. T. Williams	Mar. 17, 1908
903,755, H. McChesley	Nov. 10, 1908
940,013, D. J. Havenstrite	Nov. 16, 1909
961,781, F. E. Laverty	June 21, 1910
961,839, A. H. Buckley	June 24, 1910
985,601, W. F. Johnson	Feb. 28, 1911
990,590, W. T. Ray	April 25, 1911
990,591, W. T. Ray	April 25, 1911
993,771, J. D. Gallagher	May 30, 1911
1,013,470, M. J. Bannister	Jan. 2, 1912
1,166,623, T. M. Myers	Jan. 2, 1916
1,232,569, L. B. Coshland	July 3, 1917
1,266,976, G. W. Tribbey	May 14, 1918
1,451,376, H. J. Smith	April 10, 1923

Sub Class 112

Ice Making Apparatus, Separator, Heated Cutter

Ice making apparatus with a heated cutter for a separator.

174,833, T. B. McFadden	Mar. 14, 1876
325,028, L. Pusey	Aug. 28, 1894
530,127, L. Pusey	Dec. 4, 1894
546,253, G. E. Milliken	Sept. 10, 1895
892,223, F. B. Clark	June 30, 1908
904,569, P. F. Stein	Nov. 24, 1908
934,524, C. D. Havenstrite	Sept. 21, 1909
956,604, G. F. Savoy	May 3, 1910
982,040, A. Day	Jan. 17, 1911
1,016,550, F. B. Clark	Feb. 6, 1912
1,030,024, W. T. Weaver & G. L. Beard	Dec. 25, 1912
1,038,363, C. L. Gray	April 8, 1913
1,250,010, G. Pouchan	Dec. 11, 1917
1,288,039, I. Kruger	Dec. 17, 1918

1,477,631, J. Deenihan	Dec. 18, 1923
1,487,547, P. Dow	Mar. 18, 1924
1,548,071, M. J. Uline, et al.	Aug. 4, 1925
1,584,921, H. L. Gee & R. H. Darby	May 18, 1926

Sub Class 113

Ice Making Apparatus, Separator, Can Heater

Ice making apparatus in which the can or tank in which ice is formed has means for releasing the ice therefrom by heat.

469,320, A. Ruemmel & F. Bauer	Feb. 23, 1892
508,145, H. Mock	Nov. 7, 1893
535,415, G. O. Rinman	Mar. 2, 1895
547,251, O. Hammond, Jr.	Oct. 1, 1895
556,584, H. Mock	Mar. 17, 1896
577,175, R. C. Reynolds & B. M. Kiker	Feb. 16, 1897
593,680, W. F. Niebling	Nov. 16, 1897
821,957, T. G. Nicewarner	May 29, 1906
861,477, T. G. Nicewarner	July 30, 1907
1,485,314, J. H. Taylor, et al.	Feb. 26, 1924
1,496,625, N. Choate	June 3, 1924
1,508,440, T. Blair	Sept. 16, 1924
1,516,167, E. Weber	Nov. 18, 1924

Sub Class 114

Congelation Apparatus

Apparatus for freezing a liquid other than water not otherwise classified.

146,792, G. P. Herndon	Nov. 10, 1874
284,212, E. Kells	Sept. 4, 1883
316,058, C. H. Prentiss	April 21, 1885
344,709, G. T. Beilby	June 29, 1886
436,337, F. W. Cochrane	Sept. 16, 1890
523,781, L. & J. D. Wallace	July 31, 1894
676,130, C. S. Goodfellow	June 11, 1901
751,360, A. L. Tenney	Feb. 2, 1904
916,319, A. E. Iverson & A. R. Wilson	Mar. 23, 1909
1,046,307, M. Kind	Dec. 3, 1912
1,113,807, C. S. Meisenhelter	Oct. 13, 1914
1,309,995, C. Bates	July 15, 1919
1,396,972, J. F. Pfeiffer	Nov. 15, 1921
1,455,156, R. A. Wilson	May 15, 1923
1,473,065, G. A. Wagner	Nov. 6, 1923
1,477,279, J. G. Peck	Dec. 11, 1923
1,495,125, J. Willmann	May 20, 1924
1,504,756, H. B. Hamill	Aug. 12, 1924
1,568,898, C. McNair	Jan. 5, 1926
1,584,580, J. Willmann	May 11, 1926
1,609,915, M. W. Parker	Dec. 7, 1926

Sub Class 115

Compressor-Condenser-Expander Circuit

Apparatus for compressing a condensable gas, passing it to a condenser or cooler, then to an expander or expansion coil, where it absorbs heat and is vaporized and returns in a closed circuit to the compressor.

Note.—This subclass includes the combination of the circuit even though any of the elements are specific.

10,221, A. C. Twining	Nov. 8, 1853
35,051, A. C. Twining	April 22, 1862
63,405, T. S. C. Lowe	April 2, 1867
63,413, T. S. C. Lowe	April 2, 1867
85,719, C. Teller	Jan. 5, 1869
87,084, P. H. Vander Weyde	Feb. 16, 1869
94,450, A. H. Tait	Aug. 31, 1869
95,347, D. L. Holden	Sept. 28, 1869
De 3,929, T. Scheffer	Mar. 22, 1870
106,251, E. S. Boynton	Aug. 9, 1870
108,574, J. A. Ellis	Oct. 25, 1870
108,851, P. H. Vander Weyde	Nov. 1, 1870
110,573, J. Krafft	Dec. 27, 1870
112,284, A. Rock	Feb. 28, 1871
118,649, James E. Sears	Aug. 28, 1871
121,402, A. Muhl	Nov. 28, 1871
121,888, Andrew Muhl	Dec. 12, 1871
Re 4,806, J. A. H. Ellis	Mar. 12, 1872
128,448, D. Boyle	June 25, 1872
Re 4,992, Martin & Beach	July 16, 1872
131,783, R. Reece	Oct. 1, 1872
Re 5,201, W. A. Royce	Dec. 24, 1872
146,620, A. C. Twining	Jan. 20, 1874
146,621, A. C. Twining	Jan. 20, 1874
150,477, S. B. Martin	May 5, 1874
152,435, B. F. Teal	June 23, 1874
168,501, A. Jas	Oct. 5, 1875
187,413, R. P. Pictet	Feb. 3, 1877
190,036, D. L. Holden	April 24, 1877
191,236, C. L. Riker	May 29, 1877
204,561, E. Fixary	June 18, 1878
205,419, J. Ring	June 25, 1878
208,305, J. Gamgee	Sept. 24, 1878
222,433, W. Young & A. Neilson	Dec. 9, 1879
227,703, C. C. Palmer	May 18, 1880
228,364, C. P. G. Linde	June 1, 1880
236,843, A. J. Rossi & L. F. Beck	Jan. 18, 1881
237,372, J. C. De La Vergne & W. M. Mixer	Feb. 8, 1881
239,666, C. C. Palmer	April 5, 1881
240,697, J. F. Gesner	April 16, 1881
246,406, F. M. McMillan	Aug. 30, 1881
246,747, C. W. Gelett	Sept. 6, 1881
254,203, E. Fixary	Feb. 28, 1882
258,682, G. W. Stevens	May 30, 1882
Re 10,221, R. P. Pictet	Oct. 24, 1882
268,196, J. T. Davis	Nov. 28, 1882
268,347, W. H. Wood & G. Richmond	Nov. 28, 1882
274,500, J. C. Kline	Nov. 27, 1883
276,824, S. W. Johnson	May 1, 1883
277,797, J. Siddleley & F. N. Mackay	May 15, 1883
281,090, H. Logan	July 10, 1883
283,054, W. M. Wood & W. L. Baillie	Aug. 14, 1883
290,794, C. C. Palmer	Dec. 25, 1883
290,795, C. C. Palmer	Dec. 25, 1883
302,294, J. J. Suckert	July 22, 1884
Re 10,522, C. P. G. Linde	Sept. 16, 1884
308,980, C. C. Palmer	Dec. 9, 1884
310,616, J. Ring	Jan. 13, 1885
320,305, J. J. Suckert	June 16, 1885
320,306, J. J. Suckert	June 16, 1885
320,307, J. J. Suckert	June 16, 1885
320,308, J. J. Suckert	June 16, 1885
320,309, J. J. Suckert	June 16, 1885
321,669, W. H. Wood	July 7, 1885
323,749, F. Stitzel	Aug. 4, 1885
326,027, H. A. Fleuss	Sept. 8, 1885
328,624, O. Verzin	Oct. 20, 1885
329,726, P. Effertz	Nov. 3, 1885
331,530, H. Neuhoff & Neubecker	Dec. 1, 1885
332,344, E. Jungensfeld & H. Rassbach	Dec. 15, 1885
336,235, E. E. Hendrick	Feb. 16, 1886
336,952, A. Schmitz	Mar. 2, 1886
342,543, J. Schuehle	May 25, 1886
344,310, A. Evans, Jr.	Dec. 22, 1886
345,059, H. C. Johnson	July 6, 1886

346,184, W. H. Wood	July 27, 1886
356,382, D. Smith	Jan. 18, 1887
372,327, R. P. Pictet	Nov. 1, 1887
373,319, A. Snyder	Nov. 15, 1887
386,447, V. H. Becker	July 24, 1888
390,836, L. Block	Oct. 9, 1888
420,188, J. L. Clark, C. H. Culver & J. H. Stratton	Jan. 28, 1890
441,995, N. W. Wheeler	Dec. 2, 1890
446,076, T. Rose	Feb. 10, 1891
452,536, E. T. Winkler	May 19, 1891
453,651, C. F. Miller & A. W. Carille	June 9, 1891
464,348, P. Beck	Dec. 1, 1891
464,862, F. L. Fouda, R. C. Roach & W. H. Underwood	Dec. 8, 1891
482,268, C. W. Nason & C. H. Leinert	Sept. 6, 1892
489,335, A. Seibert	Jan. 3, 1893
489,387, J. A. Muller	Jan. 3, 1893
493,036, R. Leslie	Mar. 7, 1893
502,437, E. D. Kendall	Aug. 1, 1893
504,091, P. I. Schmalz	Aug. 29, 1893
504,094, P. I. Schmalz	Aug. 29, 1893
508,141, J. Levy, T. H. Butler & C. A. McDonald	Nov. 7, 1893
519,730, J. E. McLaughlin	May 15, 1894
525,224, S. S. & C. W. Miles	Aug. 28, 1894
530,494, W. L. Church & S. A. Reeve	Dec. 4, 1894
534,859, D. L. Cook & F. C. Pickrell	Feb. 28, 1895
537,590, M. Wanner	April 16, 1895
537,623, E. T. Winkler	April 16, 1895
551,107, M. Audiffren	Dec. 10, 1895
559,533, G. F. Knox & E. L. Sharpneck	May 5, 1896
580,049, M. G. Heim & W. Notberg	April 6, 1897
598,814, M. Reid	Feb. 8, 1898
602,199, J. Sedlacek	April 12, 1898
604,162, J. Sedlacek	May 17, 1898
618,004, J. J. Faulkner	Jan. 17, 1899
623,270, L. Block	April 18, 1899
633,207, C. W. Miles	Sept. 19, 1899
634,335, A. Glasson	Oct. 3, 1899
640,705, W. Helm	Jan. 9, 1900
640,910, G. B. Hiett	Jan. 9, 1900
653,171, C. J. Coleman	July 3, 1900
653,173, C. J. Coleman	July 3, 1900
659,559, T. Shipley	Oct. 9, 1900
659,610, T. Shipley	Oct. 9, 1900
677,845, C. J. Coleman	July 2, 1901
704,062, J. T. Ludlow	Aug. 8, 1902
726,216, C. J. Coleman	April 21, 1903
726,188, C. J. Coleman	April 21, 1903
730,454, C. W. Vollmann	June 9, 1903
739,496, G. T. Voorhees	June 21, 1903
737,824, G. T. Voorhees	June 23, 1903
737,079, A. M. Chase	Aug. 25, 1903
742,584, T. H. Butler	Oct. 27, 1903
748,296, W. H. Miller	Dec. 29, 1903
757,904, C. J. Coleman	April 12, 1904
757,393, C. J. Coleman	April 12, 1904
761,701, C. C. Palmer	June 7, 1904
764,515, M. A. Audiffren	July 5, 1904
803,189, C. C. Palmer	Oct. 31, 1905
816,810, C. E. Moleworth	April 3, 1906
824,459, L. Werlun	Oct. 16, 1906
825,073, C. H. Reynolds	Oct. 16, 1906
842,147, D. J. Havenstrite	Jan. 22, 1907
855,983, F. A. Rider	June 4, 1907
871,325, C. J. Coleman	Nov. 19, 1907
884,285, H. Rassbach	July 28, 1908
898,400, M. Audiffren & H. A. Singer	Sept. 8, 1908
911,635, R. Whitaker	Feb. 9, 1909
929,151, R. F. Massa	July 27, 1909
929,460, F. P. Moran	July 27, 1909
930,128, C. D. Bauer	Aug. 3, 1909
932,599, R. Whitaker	Aug. 31, 1909
932,946, F. L. Barkdoll	Aug. 31, 1909
936,065, C. F. Vorhees	Sept. 5, 1909
936,065, R. Whitaker	Oct. 6, 1909
970,807, A. Faget	Sept. 20, 1910
971,182, A. Faget	Sept. 27, 1910
971,984, A. Gaide	Oct. 4, 1910
974,184, W. M. Pruett	Nov. 1, 1910
977,475, G. H. Reynolds	Dec. 6, 1910
977,625, M. Leblanc	Dec. 6, 1910
1,000,723, E. Dettmar	Aug. 15, 1911
1,003,283, C. T. Marshall	Sept. 12, 1911
1,014,120, C. J. Coleman	Jan. 9, 1912
1,025,561, W. A. Byerly	May 7, 1912
1,041,317, A. B. Mattingly	Oct. 15, 1912
1,054,473, C. Schneider	Mar. 25, 1913
1,063,168, W. C. Whitney	May 27, 1913
1,064,272, L. Wolf	June 10, 1913
1,068,623, W. I. Bodine	July 29, 1913
1,071,713, W. F. Davis	Sept. 2, 1913
1,079,610, T. Shipley	Nov. 25, 1913
1,082,512, E. Gainer	Dec. 30, 1913
1,084,204, E. H. Frimann	Jan. 13, 1914
1,086,675, G. I. Leonard & W. C. Cutler	Feb. 10, 1914
1,091,957, F. A. Pollard	Mar. 31, 1914
1,100,015, F. Hirth	June 16, 1914
1,106,244, W. Schlemann	Aug. 4, 1914
1,106,288, C. H. Reynolds	Aug. 4, 1914
1,109,225, D. J. Havenstrite	Sept. 1, 1914
1,117,186, C. C. Hansen & A. P. Anderson	Nov. 17, 1914
1,120,220, T. E. Murray & A. W. H. Griene	Dec. 8, 1914
1,131,004, W. H. Pruett	Mar. 9, 1915
1,131,130, C. H. Harwood	Mar. 9, 1915
1,131,169, J. H. Stone	Mar. 9, 1915
1,132,176, A. O. Girard	Mar. 16, 1915
1,145,226, J. C. Bertsch	July 6, 1915
1,148,227, G. Heeley	July 27, 1915
1,155,780, M. Audiffren & H. A. Singer	Oct. 5, 1915
1,161,937, L. Horsborsly	Oct. 5, 1915
1,164,245, J. J. Wood	Dec. 34, 1915
1,171,914, G. Murray	Jan. 11, 1916
1,170,591, E. W. Anger & H. H. Horsborsly	Feb. 8, 1916
1,172,873, E. P. Connelly	Feb. 22, 1916
1,177,873, E. P. Connelly	Mar. 28, 1916
1,184,112, G. I. Leonard & W. C. Cutler	April 18, 1916
1,193,161, G. I. Leonard	Aug. 1, 1916
1,195,162, W. S. Stair	Aug. 15, 1916
1,195,844, T. M. Myers	Aug. 22, 1916
1,197,636, A. J. Jackson	Sept. 12, 1916
1,202,863, G. I. Leonard	Oct. 10, 1916
1,202,864, W. R. McGinnis	Oct. 10, 1916
2,004,061, B. & J. B. McKenpol	Nov. 7, 1916
2,04,918, W. P. Wiemann	Nov. 14, 1916
2,05,477, J. F. Place	Nov. 21, 1916
2,06,633, J. F. Winkler	Nov. 28, 1916
2,07,803, J. F. Winkler	Dec. 12, 1916
2,226,391, T. Shipley	May 15, 1917
2,145,179, J. C. Bertsch	Nov. 6, 1917
2,250,898, J. C. Kitton	Dec. 18, 1917
2,252,801, H. S. Heller	Jan. 8, 1918
2,252,026, V. J. Goetz	Jan. 8, 1918
2,253,895, T. Shipley	Jan. 15, 1918
2,263,633, G. I. Leonard	April 23, 1918
2,267,797, H. A. Parkyn	May 28, 1918
2,273,653, C. Orr	July 23, 1918
2,276,612, R. E. Bechtold & A. W. Mellows	*Aug. 20, 1918
2,280,101, D. I. Davis	Sept. 24, 1918
2,281,820, C. Orr	Oct. 15, 1918
2,281,820, C. Orr	Oct. 15, 1918
2,282,507, E. F. Fisher	Oct. 22, 1918
2,282,516, G. J. Zisch	Oct. 22, 1918
2,284,964, P. P. Anderson	Nov. 19, 1918
2,296,012, E. R. Sage	Mar. 4, 1919
3,305,425, G. A. Wegner	June 3, 1919
3,313,663, E. T. Williams	Aug. 19, 1919
3,315,859, G. H. Crampton	Aug. 19, 1919
3,325,211, T. Shipley	Dec. 16, 1919
3,326,626, C. Orr	Dec. 30, 1919
3,340,427, A. A. Wehr	May 18, 1920
3,344,502, W. H. Stotes	June 22, 1920
3,362,757, D. H. Stokes	Dec. 21, 1920
3,369,734, E. Iller	Feb. 22, 1921
3,369,734, G. G. Gass	Mar. 2, 1921
3,373,174, J. G. DeRemer	Mar. 29, 1921
3,375,836, E. F. Fisher	April 26, 1921
3,389,747, P. Fischbacher	Sept. 6, 1921
4,084,453, J. C. Gosmann	Mar. 7, 1922
4,088,393, A. S. Haslam	Mar. 7, 1922
4,112,827, E. T. Williams	April 11, 1922
4,133,841, E. T. Ford	April 23, 1922
4,145,231, H. W. Dyer	May 9, 1922
4,145,399, W. H. Robinson	May 9, 1922
4,16,878, A. G. Ross	May 23, 1922
4,224,826, A. D. Karr & K. D. Perkins	Aug. 8, 1922
4,229,460, A. Sedrol	Nov. 28, 1922
4,229,815, G. I. Leonard	Nov. 28, 1922
4,46,727, C. G. Smith	Feb. 27, 1923
4,49,848, W. Wishart, et al	Mar. 27, 1923
4,51,591, J. G. DeRemer	May 1, 1923
4,55,580, G. Ferguson	May 15, 1923
4,56,666, V. L. Adams	June 19, 1923
4,600,353, H. Smith	June 26, 1923
4,606,072, S. H. Todd	Aug. 28, 1923
4,606,971, A. C. Stewart	Sept. 4, 1923
4,677,796, A. D. Karr, et al	Sept. 11, 1923
4,679,968, J. F. Winkler	Oct. 11, 1923
4,699,729, D. D. Myers	Oct. 22, 1923
4,717,732, G. A. Horne	Oct. 25, 1923
4,822,024, W. Z. Field, et al	Jan. 29, 1924
4,825,907, W. Z. Field	Mar. 4, 1924

Color Illumination As an Aid to the Sale of Electric Refrigeration

Make the Refrigerator Look Cold But Make the Background Look Warm

By Willis Parker

The dealer in electric refrigeration may well consider the power of color illumination in connection with his window and store displays. It is the modern illumination method and serves to increase the force of the advertising message and sales argument as presented through the visualization of the merchandise. Interviews with some dealers in electric refrigeration and the application of the principles of color illumination as expounded by other users of it, indicate that it can be used for three purposes.

First: To meet white light competition with lower intensities of light.

Second: To bring out salient points in the display—either in the merchandise or the decorations.

Third: To increase the beauty of the merchandise.

The Denver branch of the Frigidaire company has worked out color illumination to a point somewhat further than many others. The principles explained henceforth are based mostly upon the uses made of it by this company backed up by investigations of uses employed by other Denver distributors, such as the Western Appliance Company, handling the Coldac, and the Public Service Company.

Color to Meet Competition

Consider first the use of colored illumination to meet competition for attention. Where the dealer is located in a region of many mercantile establishments vying with each other to gain the attention of window shoppers it is customary to meet the competition with higher intensities of white light. There is also the competition given by street lighting, which, although it does not intend to detract from the merchant's display windows, will do so unless he burns sufficient light in his windows to overcome the street lighting.

The theory is that the public, like the moth, is attracted to the most brilliantly lighted window. To dominate with white light often means excessively high electric light bills. But the merchant who gives a color tone to the light that is flowing out of his windows onto the sidewalk may meet white light competition with lowered intensities and therefore smaller light bills. This applies only to the illumination as an attention attracting medium.

Selecting the Right Color

As to bringing out the qualities of the merchandise, there is great danger of presenting the wrong effect, unless great care is taken as to how the light is directed and what colors are chosen. Also, if colored light is expected to illuminate the merchandise, the dealer must take care that the color chosen does not reduce legibility

the merchandise is of small units, or if the show cards are printed in small lettering, it will be difficult to see details unless candle power is greatly increased.

Before discussing the colors best suited for displays of electric refrigeration, let us consider the colors generally used in business. Amber is more widely used than any other color. An amber shield over a white light permits 65 per cent of the light to pass through, so that, from a legibility standpoint, this color is one of the best. Red holds back about 65 per cent of the light, purple and dark blue retard the light to greater proportions; green comes next to amber in permitting the light to pass through. Steel blue (sometimes called "daylight blue") is one of the best colors to use as far as legibility is concerned, but it doesn't attract as much attention to the window and make it stand out prominently from the other windows in the neighborhood as does some other color.

Using Color for Emphasis

The second use of color illumination—that of bringing out some salient point in the display—is probably the most useful to the dealer in electric refrigerators. The average display usually consists of one or two electric refrigerators in the window with decorative backgrounds, and with one or two posters standing on easels or hung from the background so as to be easily read by the shopper. As a rule the background is for the purpose of making the display unit—the refrigerator or the mechanism—stand out more prominently. Color may be used in these backgrounds. By equipping the transom bar reflectors with frames, color shields either of glass or sheet gelatine, may be slipped into them and their rays directed against the backgrounds to accentuate their beauty. Under such conditions the color used is generally one which harmonizes with the color in the background.

The Frigidaire company goes in strong for backgrounds of large proportions and containing much color. These colors are brought out at night by exceptional use of colored lights directed against them. There may be two, three, or four major colors used, and likewise there will be two, three or four colored lights directed against the background, each light concentrated as much as possible upon the color it is to sustain, giving life to the picture and richness to the decorations.

There is no ostentation in the use of colored lights in this manner for the window shopper does not realize that color is being used since the light sources are concealed and the color blends into the background.

Illuminating the Refrigerator

Next comes the use of color to illuminate the merchandise itself. In most lines of merchandise the qualities of the goods are accentuated by throwing colored light upon them—dress goods, for example. Warmth is expressed by using an amber light on a walnut radio cabinet, but warmth is not a desirable quality to bring out in connection with the refrigerator itself. Practically all electric refrigerators are painted pure white because of the psychological impressions of cleanliness and coldness. These qualities are best expressed under a white light. Better still is the use of steel blue, or daylight lighting, for the ordinary white light carries a little yellow and the absolute whiteness of the refrigerator is not brought out to the same extent that it shows under natural daylight.

Combining White With Color

Thus we find the Frigidaire company, the Western Appliance Company and the Public Service company favoring the steel blue lamps to illuminate the refrigerator itself. This brings up a combination of uses of white light and colored illumination and perhaps explains why the Frigidaire people use colored light against the backgrounds. By a proper use of colored light of warm tones, an atmosphere of summer warmth may be built up as a means of forming a more natural setting for the refrigerator itself. This in the same manner that a chunk of ice on a hot day is more inviting than the same chunk of ice on a cold day in winter. Picture for yourself the bright, yellow sunlight streaming across the landscape, and, somewhere in that landscape, a huge mound of ice. Wouldn't its cold qualities make a greater impression? The same effect is produced by building up, behind and around the electric refrigerator, an atmosphere of summer warmth which accentuates the desire to possess such an appliance.

Any dealer in electric refrigerators—large or small—will find that his window advertising will have greater effect if he will give some attention to the properties and possibilities of color illumination. He may equip the transom bar reflectors with frames and color shields at a small cost and increase the effectiveness of his window advertising a hundred per cent, and a little experimenting will show him how to best bring out the effects he desires.

Electrofrust Corporation Increases Capital Stock

The Electrofrust Corporation, Naugatuck, Conn., has been allowed an amendment to its original charter providing for an increase in capital stock from \$100,000 to \$350,000. The company manufactures refrigerating boxes and cases that are Frigidaire equipped. William J. Neary is president of the company.

20 pounds pressure 280 R.P.M.

AN ACHIEVEMENT toward which refrigeration engineers have looked for years is now an accomplished fact in the Welsbach System of Refrigeration—Low-Pressure operation at Slow Speed.

Nothing to parallel the importance of this attainment has been announced since the electric refrigeration industry began to find itself. The developments combine basic principles of operation which contribute in a major

degree to simplicity, durability, reliability and economy.

Welsbach, a Company of National repute and of unquestioned financial responsibility, stands sponsor for this newest and most vital improvement in Electric Refrigeration.

Distributors, Central Stations and Dealers interested in a selling franchise should write at once to the Welsbach Company, 301 Ellis Street, Gloucester City, N. J. Adjacent to Philadelphia, Pa.

Welsbach cabinets and equipment—from foundry to finished product—made in the same plant.

LOW PRESSURE Electric Refrigeration by Welsbach

for every need

THERE are McCray refrigerators especially designed to meet every need—in stores, markets, hotels, restaurants, hospitals, institutions, florist shops, and homes. And all models are ready for immediate installation of the cooling unit—may be used with electrical or mechanical refrigeration of any type.

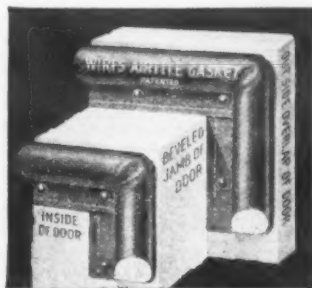
Correspondence invited
from interested dealers.

McCray Refrigerator Sales Corporation

DEPT. 66, KENDALLVILLE, IND.

Salesrooms in All Principal Cities See Telephone Directory

McCRAY REFRIGERATORS



Wirfs Gasket assures Electrical Refrigeration Efficiency

An electrical unit can only be as efficient as the box in which it is installed. Poor door contacts on wood or metal boxes mean that any unit will have to operate a greater number of hours to maintain an efficient refrigeration temperature. This means added operating cost.

Wirfs PATENTED "AIRTITE" Gasket

Keeps the cold air in and the warm air out and maintains the proper zone of refrigeration with fewer operating hours. Wide awake dealers have found that it usually clinches the sale. Most manufacturers supply boxes equipped with Wirfs; write us for their names and a sample.

E. J. WIRFS ORGANIZATION, Inc., 135 S. 17th St., St. Louis, Mo.

E. T. L. Service

for Domestic and Commercial
Electric Refrigeration

Testing and experimental laboratory service for manufacturers, distributor, central station

Test data exclusive property of client

ELECTRICAL TESTING LABORATORIES

80th Street and East End Avenue, NEW YORK CITY, N. Y.

REFRIGERATION STAMPINGS

We Specialize in the Design and Manufacture of

ICE CREAM CABINETS

We make them complete or furnish parts separately

Brine Tanks Cooling Units

Unit Supporting Bases and Perforated Metal Covers

METAL HOUSEHOLD REFRIGERATORS (Complete) OR CAN FURNISH

OUTSIDE STEEL PANELS, INSIDE LININGS, LOUVERED PANELS, LEGS, ETC., SEPARATELY

We Have a Competent Engineering Staff to Help You

We Solicit Your Inquiries and Specifications

MOTORS METAL MFG. CO. - DETROIT MICHIGAN

"WILDER METAL"

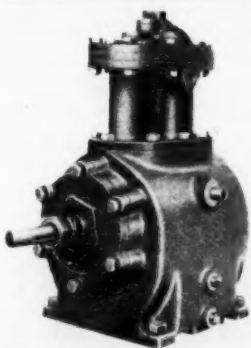
Sheets For Electric Refrigeration Construction

Permanence Against Corrosion
at a Minimum Expenditure

Obtain Samples

WILDER METAL CO.

NILES, OHIO



Refrigeration Compressors

Smooth, silent running compressors
—a product backed by years of
manufacturing compressors
and machinery

WRITE FOR DETAILS

DUNNING PUMP & MFG. CO.
326 Walnut Street PHILADELPHIA, PA.

WHY I LIKE THE ELECTRIC REFRIGERATOR

One of a Series of Interviews the Society for Electrical Development Has Had With People Who Speak from Their Own Experience.

It Is Fine for Meats if You Know How to Handle Them

By Shirley Eleanor Dane

"Of course, you must stay and have lunch with us." The tired and hungry interviewer couldn't believe her own ears, till Mrs. Y. added, "It's a long walk to the village, and besides I want you to see for yourself how my electric refrigerator has gotten to be an indispensable part of the family."

"It's not possible to get to the market every day here in the country, you know; so I often order over the phone. Bad habit, isn't it? Anyway, a week ago Saturday, when the roast of veal came for Sunday's dinner, I could have cried. It was just twice as large as I needed. A little business of deep thinking, out came the family carving knife, and half of the roast went into the cold storage right here in the kitchen. Easy to profit by such a mistake when you are lucky enough to have an up-to-date kitchen equipment. Today, just ten days later, we are going to eat that mistake. This is the way I took care of the veal (and as I happen to know about the proper handling of meats, you needn't hesitate to enjoy your lunch):

The Way to Do It Right

"First, the meat was thoroughly and slowly chilled through in the regular food compartment of the electric refrigerator. Then I removed enough trays of ice cubes to make room for the piece of meat, closed the door and just forgot about it until yesterday, when I decided it was time to have veal on the menu again.

"I had to chop it out, as it was literally a chunk of ice. Meat that has been frozen must be thawed out very gradually, so I put it on a plate on a shelf of the refrigerator. When I cut it this morning, and put it in the casserole, there was just the least trace of frost. This slow freezing and thawing out is quite essential in keeping the texture of meat. Too rapid thawing breaks down the meat fibres, and good juices are lost. Now my lecture is finished, and we'll just demonstrate the old saying that 'The proof of the pudding is in the eating!'

The children came in just as my hostess took the heavenly-smelling casserole dish out of the oven and we did have a wonderful luncheon. I'm sure no meat was ever so tender, no salad so icy cold and crisp, no frozen bread pudding so delicious.

This About Ducks

Afterwards, Mrs. Y. gave me a clever idea which you may put in use next fall if someone in your family loves duck shooting. She said:

"When my husband came home with a lot of wild duck, we planned to have a special party, but the very people we wanted most were to be away for three weeks. I'm not crazy about very gamey game, so we dressed six beautiful black ducks and again made use of the cold storage. Result—a most successful party and a good dinner with every one enthusiastic but wondering how we had managed, as the weather had turned unseasonably warm.

"Another very worth-while saving is in buying a hind quarter of lamb," she continued. "At the present market price it is 35 cents a pound. Cut off the twelve chops

that would have cost 60 cents a pound, if purchased separately, and put them in cold storage in the electric refrigerator, cooking the leg at once. If you are good at figures, do a little sum, counting a leg of lamb at 38 cents, and you'll be surprised at the result."

NEW BOOKLETS AND LEAFLETS

General Electric

The Electric Refrigeration Department of the General Electric Company, Hanna Building, Cleveland, Ohio, has recently issued an attractive two-color booklet entitled "Simplified Electric Refrigeration," outlining the development of the new icing unit and illustrating and describing the different models that are being manufactured. A small folder (3½x6) has also been received.

Excelsior

The Excelsior Motor Manufacturing and Supply Co., 3701 Cortland Street, Chicago, Ill., sends a booklet (4x9) describing the Excelsior refrigerating machines made by the refrigeration division of this company.

Polaris

The Polaris Electric Refrigeration Company of Logansport, Ind., offers a folder entitled "Six Years Old."

Seeger

The Seeger Refrigerator Company, St. Paul, Minn., has issued a 32-page booklet (3½x7) showing the construction and design of the various cabinet models. A folio containing specifications and illustrations of each porcelain cabinet manufactured, has also been received.

Drayer & Hanson

The Drayer & Hanson Co., 728 E. Pico St., Los Angeles, Calif., are mailing folder No. 2 entitled "New Type Refrigerators Porcelain Lined for Mechanical Refrigeration." The folder contains the specifications of the Drayer & Hanson refrigerators.

Superior Sheet Steel

The Superior Sheet Steel Co., of Canton, Ohio, sends a folder in three colors entitled "A Coated Sheet Without a Flake," describing their "Galvannealed" rust-resisting process for sheet steel which they are selling to electric refrigerator manufacturers.

Absopure

The Frigidaire Division of the General Necessities Corp., Detroit, Mich., offer a two-color folder (4x9) entitled "Absopure Drawer Refrigerators—The Latest Invention."

Reol

The Reol Refrigerator Co., of Baltimore, Md., have issued an attractive and profusely illustrated booklet (8½x10) entitled "The Reol Lifetime Refrigerator." This booklet contains a description and the design of the Reol cabinets and pictures a number of prominent buildings equipped with Reols.

Everite

The Everite Products, Inc., 200 Davis Ave., Dayton, Ohio, have recently issued a 12-page, two-color booklet (4x8) entitled "The Dependable Modern Way at Less Cost." The booklet contains descriptions and illustrations of the Everite models.

Champion

A four-color folder (4x9), has been received from the Champion Electric Company, St. Louis, Mo., entitled "Iceless Refrigeration" which contains an illustrated description of various models of the Champion Electro-Ice.

HOW TO OBTAIN BACK ISSUES OF THE NEWS

Many subscribers are requesting that their subscriptions be dated back to the first issue, so that they may obtain a complete file of the paper. We regret to announce that we are unable to furnish copies of certain issues, and that it will hereafter be necessary to start all new subscriptions with the next issue of the paper appearing after the order is received. The present supply of back issues is as follows:

Copies Available at Five Cents Each:

- No. 3—October 30, 1926
- No. 4—November 20, 1926
- No. 7—January 5, 1927
- No. 8—January 19, 1927
- No. 9—February 2, 1927
- No. 10—February 16, 1927
- No. 11—March 2, 1927
- No. 13—March 30, 1927
- No. 14—April 13, 1927

Very Limited Supply—Five Cents Per Copy While They Last:

- No. 5—December 8, 1926
- No. 6—December 22, 1926
- No. 12—March 16, 1926

None Available—Cannot Furnish

- No. 1—September 11, 1926
- No. 2—October 6, 1926

Note: To obtain back issues, send cash or stamps with order. If we are unable to fill your complete order, any over-payment will be returned. Address: ELECTRIC REFRIGERATION NEWS, 409 East Jefferson Ave., Detroit, Mich.

The Nela-Graph

The Nela-Graph, Vol. 1, No. 10, "issued whenever there's something to say," by Southwestern Division, National Electric Light Association, 404 Wynne-Claughton Bldg., Atlanta, Georgia. A clever 8-page mimeographed booklet, with cover, featuring the convention to be held in Memphis, April 13-15.

Test Data on Cabinets

"Efficiency Test of Domestic Refrigerators," a reprint of a 6-page article which appeared in the March, 1926, issue of *Ice and Refrigeration*, reporting a series of tests conducted at the Armour Institute of Technology by G. F. Gebhardt and J. C. Peebles. Copies of the reprint are offered upon request by the Wood Conversion Co., 310 S. Michigan Ave., Chicago, Ill., manufacturers of balsam-wool. Ten refrigerators were used in the tests, all identical in size, shape and workmanship, with the exception of the heat insulating material used in the walls.

Standard Refrigerating Appliances

F. B. Riley & Associates, 320 Beaubien St., Detroit, Mich., have recently issued a folder containing bulletins giving description, working drawings and dimensions of various parts and appliances for electric refrigeration, including the following: brine tanks, float evaporators, condensers, tank hangers, brine pumps, liquid receivers, motor pulleys and fans, capillary expanders, belts, compressor oils, perforated metals, forged valves and fittings, expansion valves and liquid filters, automatic controls, shaft seals, cabinets, copper tubing, silver solder, machine shop and engineering service.

Economy Electric Company to Distribute Lamson

The Economy Electric Co., Worcester, Mass., a pioneer distributor of electric refrigeration machines, has arranged to handle the Lamson Ice Maid.

New Copeland Dealer in Bridgeport

The Hadley Company, Broad and John Streets, Bridgeport, Conn., chain store furniture dealers operating in several New England cities, has taken over the agency for the Copeland electric refrigerator.

Seattle Schools to Have Electric Refrigeration

The school board of Seattle, Wash., is asking for bids on special refrigeration equipment for its newest high school, the Grover Cleveland, as well as the Alexander Hamilton and John Marshall intermediate schools.

North Central Division, N. E. L. A. to Hold Convention "On Board"

The date of the annual convention of the North Central Electric Association (Minnesota, North and South Dakota geographic division of the National Electric Light Association) has been postponed from June 17-21 to June 24-28. Sessions will be held on board the S. S. Hamonic during a cruise on Lake Superior.

Subscription to Electric Refrigeration News Their Best Investment

"We might say at this time that we feel that it is the best money we have invested, and we take this opportunity in congratulating you on the very fine work of the ELECTRIC REFRIGERATION NEWS."—Kelvinator-Wheeling Co., Wheeling, Va.

Frigidaire Makes Big Shipment Abroad

Thirty-five Carloads of Equipment Billed for Points Overseas

Thirty-five carloads of Frigidaire equipment were shipped to overseas branches during March, twenty going to London, ten to Berlin, and the remaining to other European points. Shipment of twenty additional carloads to London will follow shortly, according to E. N. Madden, assistant foreign manager.

"March has been the best month for overseas business we have ever had," he said. "Overseas shipments will be three times as large as for February and three times as large as for March last year. Canadian business is increasing at approximately the same rate as in this country, being approximately double its volume for the same period of 1926."

An unusually large proportion of the recent shipment to London was composed of household refrigerating equipment. A letter recently received from L. C. Shannon, foreign manager, who is now in London, states that the English gentry is installing Frigidaires in great numbers, following passage of a recent law governing preservation of foodstuffs.

For generations the English householder has kept his family provisions in the old style larder, a half underground, brick-walled room, with slate shelves and open window. In abandoning it for electric refrigeration he will skip the ice stage of refrigeration entirely, Mr. Shannon writes.

Very satisfactory increases in business from Holland, Denmark and Switzerland were made during the month.

HOUSEWORK

A Long Island lady who has been having difficulty finding enough and suitable household help, has dedicated herself to the job of having immigrant domestics placed outside the quota set by the immigration law. She is reported to have enlisted the interest of Senator Johnson in her plight.

Probably nothing will come of the lady's campaign and probably it won't make any important difference to the country at large if nothing does. In these "electrical twenties," much of the work once performed by the housewife or hired girl is disposed of by machine for two or three cents an hour. Sweeping, washing, cooking, cleaning, refrigerating, and even dish-washing have been vastly simplified by electricity. It has taken the place of many maids in homes, which, incidentally, are smaller and more easily cared for generally than those of older generations.

Also, what constitutes a lack of help is a relative matter. Grandmother baked her own bread, beat her own rugs, swept out her house, made clothes for the family, built a kitchen fire every morning, was acquainted with a washboard and sad-iron, and not so handy with a can-opener. The conveniences of this age would have seemed a dream to her. With them she probably would not have cared if the hired girl had packed up and gone away for good.—*Detroit News*.

CLASSIFIED COLUMN

Note: Replies to advertisements with "box numbers" should be addressed to Electric Refrigeration News, 409 E. Jefferson Avenue, Detroit, Michigan. Advertising rates for this column only: Positions wanted 40 cents per line for one insertion, \$1.00 per line for three insertions. All other classifications, 50 cents per line for one insertion, \$1.25 per line for three insertions.

POSITIONS WANTED

Graduate Electrical and Mechanical Engineer, with fifteen years experience in refrigeration industry, desires to make a change. Applicant well qualified in household refrigeration with successful experience record in four phases of the industry: Designing, Selling, Installing, and Managing Service Department. Present employer advised. Address Box 29.

Three years' experience as salesman and dealer in domestic and commercial electric refrigeration fields qualifies me for responsible position in factory sales organization or branch office. Married. Address Box 23.

Experienced as dealer and manager of commercial electric refrigeration department. Seeks permanent connection in sales office at branch office or in factory. Married. Address Box 24.

POSITIONS VACANT

Manufacturers of high grade electric refrigerator cabinets need refrigerating engineer with some designing and production experience to be assistant to chief engineer. Salary dependent upon experience and qualifications. Fine opportunity for right man. Address Box 27.

FOR SALE

Have developed and patented small commercial and domestic refrigerating machine, two sizes. Sixty machines sold and running satisfactorily. Machine has outstanding advantages. Ready for active exploitation. Favorable costs, prices and demand established. Suitable manufacturing connections needed with at least partial financing. Address Box 25.

Sales Executive

The writer, who is not in accord with the present methods of merchandising, has just resigned as Sales Manager of one of the largest manufacturers of Electrical Refrigeration, and would like to form a connection with a company who are progressive and who have vision enough to see the "Handwriting on the Wall."

I have a successful record and a large distributor and dealer following throughout the United States. Address Box 28, care Electric Refrigeration News.

Might consider handling Sales Department for a progressive, well financed distributor.

Seamless Copper Tubing carried in stock in all sizes for refrigeration use. Write for prices. **WOLVERINE TUBE COMPANY** 1431 Central Ave., Detroit, Mich. **WOLVERINE** SEAMLESS COPPER AND BRASS TUBING

THERMOSTATS Automatic Controls for Refrigeration and Oil Burners
SHAFT SEALS—FLOATS LIGHT STAMPINGS
HIGH PRESSURE CUT-OUTS Engineering Department at Your Service
GOODNOW & BLAKE MFG. CO. 3840 BEAVER STREET DETROIT, MICH.

Subscription Order

BUSINESS NEWS PUBLISHING CO.
409 EAST JEFFERSON AVENUE
DETROIT, MICH.

Gentlemen:

Please enroll me as a subscriber to ELECTRIC REFRIGERATION NEWS, the Business Newspaper of the Electric Refrigeration Industry.

United States: ☐ \$1.00 per year ☐ Three years for \$2.00.
Foreign Countries: ☐ \$1.50 per year.

I am enclosing payment in the form of

☐ Check ☐ P. O. Order ☐ Cash ☐ Stamps

Name _____

Company _____

Street Address _____

City and State _____

☐ NOTE: If it is inconvenient for you to enclose payment with this order, check this square and invoice will be mailed. Do it now, while you have the blank before you. It will save the time and trouble of writing a letter and you will be sure to get the next issue.

Made to Order

A few years ago the largest Electric Refrigerator Manufacturer called for a proposal on an entirely new kind of porcelain enameling plant—a continuous plant, with work progressing from furnace to furnace by use of special conveyors, driers and forks.

FERRO was given the job. We made good. First, three furnaces were ordered and now fifteen furnaces are successfully operating. With this equipment every lining, part and panel, is completely enameled within three hours from the time it is started through the pickling operation.

Let us explain our proposition to you. We would like an opportunity of quoting on enameling equipment and would be very glad to have you consult with us as to whether or not it would be economical for you to operate your own porcelain enameling department.

Write for "Men and Methods"

THE FERRO ENAMEL SUPPLY COMPANY
Cleveland, Ohio